COMPARISON OF CHILDHOOD MAJOR AND MINOR MENTAL ILLNESS ON THE ADJUSTMENT OF SIBLINGS ATTENDING A TERTIARY-CARE HOSPITAL AND FACTORS PREDICTING POOR ADJUSTMENT

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C E R T I F I C A T E

I hereby declare that this dissertation titled "COMPARISON OF CHILDHOOD MAJOR AND MINOR MENTAL ILLNESS ON THE ADJUSTMENT OF SIBLINGS ATTENDING A TERTIARY-CARE HOSPITAL AND FACTORS PREDICTING POOR ADJUSTMENT" is a bonafide work done by **DR.MINJU K.A** under my guidance at the Department of Psychiatry, Christian Medical College. This work has not been submitted to any University in part or full.

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C E R T I F I C A T E

I hereby declare that this dissertation titled "COMPARISON OF CHILDHOOD MAJOR AND MINOR MENTAL ILLNESS ON THE ADJUSTMENT OF SIBLINGS ATTENDING A TERTIARY-CARE HOSPITAL AND FACTORS PREDICTING POOR ADJUSTMENT " is a bonafide work done by Dr.Minju K.A at the Department of Psychiatry, Christian Medical College. This work has not been submitted to any University in part or full.

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D E C L A R A T I O N

I hereby declare that this dissertation titled “COMPARISON OF CHILDHOOD MAJOR AND MINOR MENTAL ILLNESS ON THE ADJUSTMENT OF SIBLINGS ATTENDING A TERTIARY-CARE HOSPITAL AND FACTORS PREDICTING POOR ADJUSTMENT” is a bonafide work done by me under the guidance of Dr. Paul Swamidhas Sudhakar Russell, Professor of Psychiatry, Christian Medical College, Vellore. This work has not been submitted to any university in part or full.

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A C K N O W L E D G E M E N T S

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I N D E X

Thesis Abstract

COMPARISON OF CHILDHOOD MAJOR AND MINOR MENTAL ILLNESS ON THE ADJUSTMENT OF SIBLINGS ATTENDING A TERTIARY-CARE HOSPITAL AND FACTORS PREDICTING POOR ADJUSTMENT.

DEPARTMENT : Psychiatry
NAME OF THE CANDIDATE : Dr.Minju.K.A
DEGREE AND SUBJECT : M.D., Psychiatry
NAME OF THE GUIDE : Dr. Paul Swamidhas Sudhakar Russell

OBJECTIVES:

1. To compare the adjustment of siblings of children with major and minor mental illness
2. To identify factors predicting poor adjustment among siblings
3. To build a predictive model for poor sibling adjustment

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METHODS:

Consecutive children and adolescents who were diagnosed to have either major or minor mental illness with a sibling in the Child and Adolescent Psychiatry Unit and who satisfied the selection criteria were recruited for the study. The diagnosis of having a mental illness as well as quantification of adjustment among siblings were done using standard measures and independent assessors. Descriptive analysis and comparison between groups with independent student's t test and Chi-square was done to compare the continuous and categorical factors respectively between the major and minor mental illness groups. Univariate regression analyses were performed for all predictive factors against the dependent variable (dichotomized sibling adjustment of poor and good adjustment). Adjusted analysis was done for all predictive factors found significant in the bivariate analyses with life event and academic stress as confounders for sibling adjustment.

Finally, a parsimonious model predicting the risk factors was built using multiple regression analyses.

RESULTS:

The total score and subscales scores of Pre-adolescent Adjustment Scale and Child Adjustment Scale were compared between the major and minor mental illness groups. The difference between the groups in the Pre-adolescent Adjustment Scale was at P=0.023, while two subscales of the measure (adjustment with -teachers and general adjustment) were significantly different at P=0.015 and 0.057 with scores showing poor adjustment for siblings of children with major mental illness. In the univariate logistic regression analyses to identify the predictive factors associated with poor sibling adjustment, chronological age of patient and sibling, socio-economic status and the use of the problem solving coping were related to poor adjustment. However, when academic stressors and life events were controlled for in the multivariate logistic regression, only the use of the problem solving coping was related to poor adjustment while the socio-economic status showed a trend towards predicting poor adjustment, with a differential negative relationship between the socio-economic status and poor adjustment. The model building was done with multivariate regression analyses, where the dichotomized adjustment of siblings, as good and poor adjustment was taken as the outcome variable. Socio-economic status contributed to the predictive model but was not statistically significant. However using problem solving coping style significantly predicted the presence of poor adjustment among siblings, irrespective of the sibling having major or minor mental illness. Those siblings using problem solving coping style were more than 3-fold at risk (OR= 3.111) of developing poor adjustment.

CONCLUSION:

Significantly poorer adjustment was noted among siblings of children with major mental illness. The independent factors of socio-economic status of the sibling and use of problem solving coping were found to be significantly associated with the poor adjustment among siblings. Also, socio-economic status of the sibling and use of problem solving coping cumulatively resulted in the predictive model.

INTRODUCTION

Siblings of children with mental illness often go through various adversities. Considering childhood and adolescence as a critical period of development, the impact of the mental illness and the consequent negative influence can affect the functioning of the siblings in their everyday life. There is accumulating evidence that children and adolescence are affected by chronic illness or disability of an ill sibling and thus experiences anger, resentment, guilt, identity threats, premature responsibility often parentifying them and social isolation resulting in serious emotional disturbances (Seligman, 1987). Their psychological functioning, peer activities and cognitive development are also affected (Sharpe and Rossiter, 2002). Controversially, studies have also shown that siblings of children need not exhibit externalizing or internalizing behavior problem (Ross and Cuskelly, 2006), and furthermore siblings can show positive outcomes while growing up with a chronically ill sibling (Labay and Walco, 2004). Most of the existing literature is based on siblings of physically ill, intellectually or developmentally disabled children. Thus, siblings of children and adolescents with psychiatric disorders constitute a doubly vulnerable group for compromised mental health; firstly, as they are exposed to the same genetic risks as the index children with psychiatric disorder. Secondly, having a child with a psychiatric disorder brings about specific shared environmental challenges that can affect the various psychological functioning of the siblings. One of the psychological functions that can be greatly impaired is the adjustment of the siblings in the context of the various family systems and supra system related factors.

Currently, there are studies of adjustment of siblings of mentally ill in the adult population, which shows that these siblings are at high risk for unemployment, unstable marital relationships and psychological distress (Taylor et al., 2008), and have identified these siblings as secondary victims (Barak and Solomon, 2005). However, there is paucity of literature, globally, in the context of the adjustment of siblings of children with Major mental illness and none in the subcontinent. Therefore, there is an imminent need to conduct such studies at the international, national and local levels. Documentation of mental health needs of the siblings of children with major mental illness in India will help integrate the findings in to policy frameworks and formulate clinical identification as well as intervention strategies for the affected siblings. Hence this observational study was conducted which compared: (1) the impact of the major mental illnesses against the impact of the minor mental illnesses on the adjustment of siblings (2) identified the factors associated with poor adjustment of the siblings of children and adolescents with major and minor mental illnesses.

I. LITERATURE REVIEW

II.a. Mental health in children and adolescents

World health organization has defined mental health in children and adolescents as: *"The capacity to achieve and maintain optimal psychological functioning and well being"* (Patel et al., 2008). Thus the mental health is directly related to the functional level reached and competence achieved in psychological and social functioning by the juvenile population. The lack of attention to the mental health of children and adolescents may lead to mental disorders with lifelong consequences, undermines compliance with health regimens, and reduces the capacity of societies to be safe and productive (Patel et al., 2008). This stand by the World Health Organization underscores the need to focus on the mental health of children and adolescents world-wide.

II.b. Prevalence of mental illness among children and adolescents

According to World Health Report, 20% of children and adolescents suffer from a disabling mental illness worldwide (Remschmidt and Belfer, 2005). Epidemiological studies looking into prevalence of mental illness in child and adolescent psychiatry population shows disparate results. It ranges from 9.5 % in Office for National Statistics (ONS) study to 46.3 in a US study (Office for National Statistics, 1999). The prevalence studies in the different part of the world are below (Table 1).

Table 1:

The recent epidemiological studies on the mental health of children and adolescents in the different part of the world

Author	Year	Centre	Age (years)	Prevalence (%)
ONS	1999	Britain	5-15	9.5
Costello et al	2003	US	9-16	13.3
Merikangas et al	2004	US	13-18	46.3
Merikangas et al	2004	US	8-15	13.1

In a summary of results of prevalence studies done since 1993, Costello et al gives a prevalence of 45% in age group 5-17 years(Costello et al., 2005). Recent studies done in different parts of India shows a prevalence ranging from 6% to 16.5% (Table 2).

Table 2:

The recent epidemiological studies on the mental health of children and adolescents in the different part of the world

Author	Year	Centre	Age (years)	Prevalence (%)
Hackett et al	1999	Kerala	8-12	9.4
Malhotra et al	2002	Chandigarh	4-11	6.03
Srinath et al	2005	Bangalore	0-16	12.4
Anita et al	2007	Rohtak	6-14	16.5
Pillai et al	2008	Goa	12-16	10.81

The variation in the rates is due to the inclusion and exclusion of certain diagnosis like developmental disorders, intellectual disability and behavioral and emotional disorders of childhood. Meta-analysis done by Bhola and Kapur in 2003 of studies published from 1964 to 2002, reported a prevalence rate of 0.48-29.4% in community based studies and 3.23-36.5 % in school based studies.

II.c. <u>Adjustment of Siblings</u>

Siblings are often referred in literature as secondary victims (Barak and Solomon, 2005) or the invisible children (Naylor and Prescott, 2004). As they share common environmental and genetic risk factors, they are at risk population (Hannah and Midlarsky, 1999). Mental illness in family leads to disruption in family's life cycle and

strongly affects the sibling relationship. Parent's preoccupation with the ill sibling can result in emotional disturbance of the well sibling and create a great psychological need in them (Seligman, 1987). While the target child or the ill child gets the benefit of attention from the parents and the treating team, the emotional and often physical needs of the well sibling are neglected. These siblings do not figure in the global burden, hence are often forgotten

II.c.1. **Adjustment of siblings in general**

Ability to respond and manage the stressors in life is referred to as adjustment (Jackson et al., 2008). It is documented that if the siblings of children with chronic illness have the demand of growing up with an ill sibling is more than the coping resources and environmental supports the child has, it can result in adjustment problems. On the other hand if the resources are adequate the sibling can adjust well inspite of the stressor of having an ill sibling (Davis, 2010).

The difficulties in sibling adjustment can reflect as problems in their self-concept (Macks and Reeve, 2007), social competence (Hannah and Midlarsky, 1999), academic performance, emotional problems and even as psychopathology (Labay and Walco, 2004) in the sibling.

Even though family is seen as a system of interdependent members, whose members influence each other by circular causality (Velsor and Cox, 2000), siblings of chronically ill children were largely not studied in the family adjustment. With a resurgence of

interest in siblings, many studies have been done looking into the adjustment of siblings of children who are either physically or developmentally ill. Nevertheless research in this area is much inconclusive as studies have reported conflicting results (Lavigne and Ryan, 1979).

II.c.2. Siblings of physically ill children

Among studies looking into adjustment of siblings of physically ill children, some studies report increased risk for adjustment problems (Lavigne and Ryan, 1979; Mancusco et al., 2003; Hamama et al., 2000). There are other studies that report no significant differences between siblings of chronically ill and normal children (Labay and Walco, 2004; Dyson, 1999; Cadman et al., 1988; Thompson et al., 1994; Gold et al., 2008). However, various pooled data have concluded that these siblings are at increased risk for developing adjustment problems or psychopathology.

A meta-analysis of 51 studies from 1976 to 2000 pertaining to siblings of chronically ill children by Sharpe and Rossitier (2002) reported that having a physically ill sibling has a negative overall impact on the adjustment mainly in the areas of psychological functioning, peer relations and cognitive development. Yet another literature review by Williams et al. (1999) of 40 studies pertaining to the siblings of physical ill children reported that siblings are at increased risk to experience loneliness, anxiety, depression, low levels of self competence, self esteem and externalizing behaviour problems. So also Literature review by Murray et al. (1999) looking into sibling adjustment in childhood cancer patients reported that these children are more prone for anxiety and depression.

Positive outcomes have also been identified among the siblings such as empathy, maturation and increased appreciation for life (Murray et al., 1999). Another recent meta-analysis by Vermaes et al. (2012) also reported that these siblings are more at risk for developing externalizing and internalizing problems and develop less positive self attributes.

II.c.3. Siblings of developmentally disabled children

Research in sibling adjustment of intellectually disabled or autistic children is also gaining importance. These results are also contradictory with some studies reporting increased risk for adjustment problems (Ross and Cuskelly, 2006; Fisman et al., 1996; McHale and Gamble, 1989) and other studies showing no differences in any outcome studied (Dyson, 1999; Hannah and Midlarsky, 1999; Gold et al., 2008; McHale and Gamble, 1989. Interestingly, yet some other showing positive adjustment (Van Riper, 2000; Macks and Reeve, 2007). Studies comparing siblings of children with dual disability of intellectual disability and autism show poorer adjustment by siblings of autism children alone (Bagenholm and Gillberg, 1991; Pillowsky et al., 2004; Fisman et al., 1996).

A meta-analysis by Sharpe and Rossitier (2001) identified a small negative effect for sibling of children with intellectual disability. Another recent meta-analysis by O' Brien et al. (2009) reported that while siblings of children with Down syndrome are well adjusted, studies on siblings of autistic children were inconclusive.

II.c.4. Siblings of mentally ill children

There is paucity of literature, globally, in the context of the adjustment of siblings of children with major mental illness and none in the subcontinent. Kilmer et al. (2008) in his study on siblings of children with severe emotional disturbances reported that fifty percent of these siblings have higher than average level of personal strengths; however one in six siblings had scores that showed high probability to develop emotional disorder. Similar result was reported in another study by David and Harrington (2006) who studied psychosocial functioning of siblings of children with anxiety disorders. More than 50 percent of these siblings were found prone for adjustment problems. Barnett and Hunter (2011), in their study of siblings of mentally ill children reported that these siblings have poor quality of life, higher rates of psychopathology and increased vulnerability to adjustment difficulties. Negative outcome in terms of poor quality of life was also reported by Aremit et al. (2010) in the study of siblings of children with eating disorder.

II.d. Adjustment of families

Chronic illness in a family member can be devastating. This devastation is more pronounced when it is in children. Its effects on the family are studied by many researchers. Family experiences considerable stress (Williams, 1997) and have feelings of denial, anger, depression, guilt and self-blame (Heimann, 2002). Studies show that there is significant impact on family adjustment and relationships (Murray, 1999; Ellenwood and Jenkins, 2007; Murray, 2012). While some studies show good adjustment and development of resilience (Williams, 1997; Murray, 2012), there are other studies that

reports negative outcomes (Zahr et al. 1994; Farber, 1960). Parents of developmentally ill children reported more stress and adjustment problems (Sander and Morgan, 1997) and have more psychological problems, marital problems and family dysfunction (Gau et al., 2012).

Comparatively few studies are done on adjustment of families of mentally ill children and adolescents (Egger and Angold, 2006). Significant perceived care-giving burden in the parents are reported in certain studies (Egger and Angold, 2006). On the other hand these families have also reported positive effects conceptualized as enrichment, (D.K et al. 1998) experiences of caring for the mentally ill child enhances the quality and meaning of life. However Cadman et al. (1991) warns us to be cautious of expectation bias and probable over-interpretation of stress in families with a child with chronic illness.

II.e. Other factors associated with adjustment

Studies have looked into various factors that could influence the adjustment of family member to a person with mental illness. This subsection of the literature review will focus specially on the factors associated with adjustment of siblings to a child or adolescent with mental illness in the family. This review is important to know about the possible confounders for sibling adjustment and a literature support for selecting the predictive factors for poor sibling adjustment.

Research has identified certain variables that could predict the adjustment and these include child related, sibling related, family related and supra system related factors.

While some researchers have studied self-concept, competence, compassion, empathy, functioning in school and home setting in association with sibling adjustment, others have looked into sense of loneliness, burden, depressive or anxiety symptoms in similar contexts (Kilmer et al., 2010). The various socio-demographic factors will be briefly discussed.

II.e.1. Socio-demographic factors

Demographic factors like chronological age, sex, educational level, birth order, family size and socio-economic status were the variables that have been documented to have significant relation to the adjustment of sibling with a mentally ill child in the family(Macks and Reeve, 2007; Lobato and Kao, 2002).

Gender

Macks and Reeves (2007) showed that factors such as gender, birth order, family size and socioeconomic factors affect the adjustment of siblings of children with chronic illness. However as in all sibling studies, results have been mixed with some other studies reporting no associations between these variables and adjustment of siblings (Gold, 1993; Mates, 1990; Sharpe and Rossiter, 2002; Van Riper, 2000). Male siblings of autistic children were at risk for adjustment difficulties according to Macks and Reeves (2007).

Hannah and Midriasky (1999) in their study of siblings of children with intellectual disability also reported that male siblings showed more difficulties in school. On the other hand, female sex is implicated as a risk factor in study done by McHale and Gamble (1989). Greater chance of developing internalizing problems was reported by Hanna and Midriasky (1999) as well as by Williams et al., 1997. According to Ferrari et al.(1984) same sexed siblings were reported to be more vulnerable for adjustment problems than opposite sexed pairs. Gender differences in adjustment were not noted by Kilmer et al. (2008) in his study of siblings of mentally ill children.

Age and birth order

While Hastings (2003) and Williams (1997) reported that siblings of younger age group are more vulnerable to adjustment problems, older siblings were implicated in other studies. Older sisters and younger brothers are more prone for the adjustment difficulties and behavioural problems (Gallo et al., 2003). Rodrigue et al. (1993) also reported that older age was associated with higher chance of externalising and internalising problems in siblings of autistic children. Similar result was also obtained in study of siblings of children with severe emotional disorders by Kilmer et al. (2008).

Family size and socio-economic status

Large family size was found protective by Kaminisky and Dewey (2002) and Madan-Swain (1993). Socioeconomic status can influence the relationship between family size and sibling adjustment. Low socioeconomic status through limited family resources leads

to poor adjustment (Hannah and Midlarsky, 1999; Macks and Reeve, 2007). Poverty was associated with lower level of behavioral and emotional strengths and higher level of oppositional behaviour (Kilmer et al., 2010).

II.e.2. Illness factors

Diagnostic category and severity of illness

Even though one could expect that diagnosis of the child and the severity of illness can definitely influence the adjustment of the sibling, the research in this area is also conflicting .Each illness is different in its severity, chronicity, certainty and amount of family disruption it creates and thus would affect the affect the adjustment of siblings in diverse ways. Sharpe and Rossiter (2001) in their meta-analysis of studies of sibling adjustment among children with intellectual disability argued that nature of illness and the functioning of child will undoubtedly affect the normal sibling's adjustment. Among the illness related variables, type and duration of illness were the two variables that were considered to be influential in the adaptation of a healthy sibling (Patterson and Garwick, 1994). This was also supported by Farber et al. (1960) in his studies of families with a child with intellectual disability. Similar results were also found by Dyson et al. (1999) and Drotar et al. (1985), where they suggested that type of disability can affect as a moderator variable and not a mediator variable. McHale et al. (1989) reported that siblings have a poor outcome if the diagnosis was ambiguous. Severity of illness was also implicated as a risk factor for adjustment problems as seen in study by Barlow and Ellard (2006). However Lobato (2002) and Breslau et al. (1981) have argued that the diagnosis

and severity may not necessarily affect the adjustment of the siblings. Sharpe and Rossitier (2001) in a meta-analysis of physical illness reported that even if illness is associated with high mortality it was not predictive of adjustment problems among the siblings. In the study on adjustment of siblings of mentally ill, by Barnett and Hunter (2011) diagnosis and severity of illness did not have an impact.

II e. 3.Sibling factors

Coping

There is multitude of stressors in children's life that are developmental, environmental and contextual in origin. The way they cope with the many stressors significantly affects their well-being. Research in this area is gaining importance as it is a dynamic variable, offering a chance for intervention and thus reversibility (Garcia, 2010). Many researchers have looked into the coping styles that are used by siblings with chronic illness. Lazarus (1984) described coping as the "cognitive and behavioral efforts" a person employs to manage stress. Many ways of coping have been described in the literature. The popular dichotomous way of describing coping styles is to group it in to either emotion focused or problem focused coping. Generally, the problem solving way of coping is associated with better adjustment than with avoidance or emotional strategies (Garcia, 2010; Puskar et al., 2003). Houtzager (1999) in the study of siblings of children with cancer found that cognitive coping strategies were related to better outcome than avoidance strategies. Interestingly, however this was not related to overall adjustment of sibling. McHale and Gamble (1989) studied the coping styles used by siblings of children with different types

of physical illness using Kidcope a self reported coping measure. The coping strategies were grouped into four categories which are: environment related cognition, self directed cognition, environment directed behaviour and self directed behaviour. In their study they found that siblings who used other types of directed cognitions were poorly adjusted than those who used self directed cognitions. Majority of children used emotional regulation and wishful thinking followed by social withdrawal, distraction and problem solving as coping strategies. Distraction and cognitive restructuring was found to be helpful for all the siblings and more than 80 % of siblings found problem solving, social support, social withdrawal, emotional regulation and wishful thinking as helpful (McHale and Gamble 1989). Similar finding were noted by Roeyers and Mycke (1995) in siblings of children with intellectual disability and autism. Contrary to the above evidence, coping skills were not found to be related to adjustment by Ross and Cuskelly (2006) in their study on siblings of children with autism and Madan and Swain (1993) in study of siblings of children with cancer. Kendall et al reported that siblings of children with Attention Deficit Hyperactivity Disorder more often used avoidance strategies to cope and often felt victimized (Kendall, 1999).

Sibling relationships

Sibling relationship is described as a relational connection where child manages different roles, learns to interact, handle disagreements and rivalry, to share, to love and to hate. Importantly, how well the siblings manage to do this forms the basis for future relationships between them and peers (Abrams, 2009).

Sibling relationships were significantly related to the development of children's social competence, capacity to resolve conflicts, and their emotional and social understanding (Volling et al. 2002; Dunn 1988; Herrera and Dunn 1997). Sibling relationships can be nurturing or domineering, distant or closely intimate, hostile or amicable, antagonistic or competitive (Buhrmester and Furman 1990).

"…sibling relationships are usually the strongest of all family bonds and a chronic illness may hinder the relationship…".(Thibodeau 1988). Mancusco has emphasized the importance of sibling relationship on the development and social adjustment of children.(Mancuso et al. 2003) The siblings might attempt to dissociate from the sibling affected by the illness, they might mature prematurely and take the role of caretaker or they might feel guilty or neglected. (Abrams 2009) Normal development of sibling relationship might be hampered by the presence of illness or disability (Sharpe and Rossiter 2002) On the other hand the relationship itself could buffer the adjustment of the sibling without an illness.

Kaminisky and Dewey reported less prosocial behaviour, intimacy and nurturance in siblings of autistic children when compared to siblings of children with Down's syndrome.(Kaminsky and Dewey 2002) However in an another study by Roeyers and Mycke where siblings of children with intellectual disability and physically disabled children were compared with siblings of non-disabled children, siblings of physically disabled children rated their relationship with the affected child as more positive (Roeyers and Mycke 1995). In contrast, Bagenholm and Gillberg reported that siblings of

children with intellectual disability and autism often lacked compassion and empathy and considered the children with illness as a burden (Bågenholm and Gillberg 1991). The reason given by authors is that well siblings were expected to do more chores and take more responsibilities at home. Non-conflictual sibling relationship was stated to be protective for siblings of children with Down syndrome but not for siblings of children with autism (Fisman et al., 1996). Labay and Walco in their study of siblings of children with cancer revealed that warm and nurturing relationship with the ill sibling could affect the adjustment adversely, by amplifying the stress perceived. They also might be more vulnerable to stress of separation and change in reciprocity in relationship (Labay and Walco 2004). Such findings were further validated in the context of serious mental illnesses as well by Kilmer et al.(2008).

II.e.4. Family factors

Parental stress

Loss of child, be it through death or disability is one of the greatest stressors for a parent (Rivers and Stoneman 2003). Parental stress can include the stress of caring for a disabled or ill child and also the added general stressors in their routine lives (Farber 1960; Fowle, 1968). They reported prolonged sense of sorrow hopelessness, low self-esteem, guilt, shame and marital problems. Maternal stress have been reported by various researchers to significantly affect sibling adjustment either by principle of modeling where a child copies the parental pattern of response (Stoneman et al. 1988) or by its direct impact on the child (Hastings, 2003; Fisman et al., 1996; Kao et al. 2009)

Furthermore Stoneman and Brody described poorer adjustment and increased behavioural problems in siblings when there was high level of parental stress (Stoneman et al. 1988) Parental preoccupation and stresses will also manifest as higher level of expectations on the normal child, decreased involvement and increased allocation of responsibilities which would have an impact on sibling adjustment (Hannah and Midlarsky 1999). In a study that looked into maternal well-being and sibling adjustment, poor sense of maternal well-being with increased reports of stress was associated with poor adjustment of sibling (Quintero and McIntyre 2010). Study by Jackson et al also revealed the same results in siblings of children with physical illness, especially diabetes.(Jackson et al., 2008). Similarly, parental stress and dysfunction was identified to be a risk factor for adjustment problems in siblings of children with rheumatic disease (Daniels et al. 1987).

Family functioning

Literature concerning the influence of family cohesiveness on sibling adjustment is relatively sparse. Researchers like Powell and Gallagher has emphasized the importance of open communication, which denotes transparency of thoughts, feelings and freedom to express emotions (Gallagher et al. 2006). Good family cohesion and adaptability predicted good sibling adjustment in the study done on siblings of children with cancer (Cohen et al., 1994.) So also Gold et al reported that families with high levels of expressiveness and support and low levels of conflict were associated with better adjustment of the sibling, lack of family cohesion and expressiveness were associated with more sibling adjustment problems. (Daniels et al. 1987; Gold et al. 2008). Likewise, family function scores and self perception scores were related to better sibling adjustment

(Gallo and Szychlinski 2003). Lynch et al reported that family disorganisation and family conflict leads to poor adjustment of siblings of children with Down syndrome (Lynch et al. 1993). Also, according to Giallo et al., risk and protective factors of family like socioeconomic status, family resilience and problem solving ways, better communication between the members were associated with better sibling adjustment (Giallo and Gavidia-Payne 2006). Siblings of children with disabilities were found to be more sensitive to conflicts within family (Nixon and Cummings 1999). There is no evidence for sibling relationship being protective for siblings of autistic children, and this may be due to the inherent deficits, namely the social and communication deficits, in interactions between the sibling and the child with autism (Fisman et al. 1996).

Warm and nurturing family environment is significantly important in the adjustment of sibling of children with mental illness (Kilmer et al. 2010). Family functioning was also found to be significantly correlated with the adjustment as reported by Barnett and Hunter in their study of siblings of children with mental health difficulties (Barnett and Hunter 2011).

II .e. 5 Suprasystem related factors

Academic stress

School is a major part in children's life, and academic stress is one of the most common stressors in children. Academic stress is related to sense of academic capability and academic performance which is further related to lack of parental warmth and school involvement (Juang and Silbereisen 2002).

Academic stress alone can affect the child's social and emotional functioning. Academic stress is multi-directional in its relationship: it can independently predict adjustment problems, can act as moderator variable affecting the adjustment of the sibling or academic stress can result from poor adjustment.

Mothers emotional stress level predicted increased school problems for children as evident in the studies by Yamada et al. (2007) and Quintero and McIntyre (2010). Bagenholm and Gilberg (1991) pointed out that teachers reported academic stress and behavioral problems in siblings of children with autism. Murray et al reported high chance of cognitive impairments in children with mothers who are very stressed out with illness related care-giving (Murray 1999). Hannah and Midriasky predicted more academic problems for siblings of children with intellectual disability (Hannah and Midlarsky 1999). However, Mates(1990) and Quintero and McIntyre (2010) did not report any problems in academic performance or behaviour of these children with an affected sibling.

Life event

Stressful life events can have an impact on adjustment of any individual. Research shows that adjustment difficulties increased with more number of life events (Daniels et al. 1987). Sterling et al reported that children with multiple recent stressful events were poorly adjusted in school and also showed poor competencies (Sterling et al. 1985). In the study by Kilmer et al looking into factors associated with adjustment of siblings of mentally ill children adverse life events approached statistical significance in predicting sibling adjustment (Kilmer et al., 2010).

When compared to children with no life events, students with 3 to 8 serious life events were, in general, poorly adjusted (Slee 1993). Nonetheless, other researchers have argued that that the effect of these life stressors is actually moderated by good social support and problem solving skills (Pryor-Brown and Cowen 1989; Dubow and Tisak 1989). Cohen et al also did not support the concept that multiple discrete events in a child's life will have significant effect on child's adjustment (Cohen et al., 1987).

II.f. **Measures**

The measures to study sibling adjustment, the predictive factors described above and the possible confounders for sibling adjustment are reviewed briefly.

II.f.1. **Measures for sibling adjustment**

There is no uniform definition for adjustment (Fisman et al. 1996) and so there is no single accepted measure for sibling adjustment. While some have used the construct of behavioural or emotional adjustment, (Ross and Cuskelly 2006; Breslau et al. 1981) others have used self concept (Ferrari 1984) and social competence (Rodrigue et al., 1993) as the core concept. Also, different measures have been used in widely different population and illness groups, so a comparison is difficult. Furthermore, self reported versus parental reports are found in the literature which further makes comparisons difficult (Fisman et al. 1996). The following measures have been often used in sibling adjustment research and are therefore reviewed.

Behavioral And Emotional Rating Scale (Epstein, 2004)

It is a strength based assessment tool that measures strengths and competencies in children in five aspects: interpersonal strength, involvement with family, intrapersonal strength, school functioning, affective strength and career strength. It can be applied to children of ages 5-18 yrs. There are three forms: child rated, parent rated and teacher rated. This scale has been used in many studies that have looked into adjustment of siblings of children with emotional problems.

Child Adjustment Scale (Santrock and Warshak, 1979)

This scale is developed by Santrock et al. that measures children's socio-emotional adjustment .It has four subscales: Peer relations, work habits, emotional health and compliance. Response is on five point likert scale.

Impact on sibling scale (Stein 2003)

This scale is specific for assessment of siblings of children with chronic illnesses. It is a six item measure that can identify the siblings who have adjustment problems.

Pre adolescent adjustment scale (Pareek and Rao 1975)

This scale developed by Pareek et al. contains 40 items to which child answers either yes or no. It measures the adjustment of child towards home, school, teachers, peers and general issues. Each item has a particular score and scores of subscales are obtained by adding the scores for the items checked affirmative in that group. Total score is obtained by adding up the subscale scores. High scores indicate good adjustment. This scale is used in the current study.

II.f.2. **Measures for predictive factors**

Socioeconomic status

ICMR socio economic status scale (Tiwari and Kumar, 2012)

This scale consists of seven domains, which are house, material possession, education, occupation, monthly income, land, and social participation and understanding. Each scale has a maximum score of 10. The score range (0-70) was categorized into five groups. The scale classifies the subjects into five types of socio-economic categories *i.e.* Upper, Upper-middle, Middle, Lower-middle and Lower class. The scale was found to be highly reliable with a co-relation coefficient of 0.99.

Home affluence scale (Wardle et al., 2002)

A measure of socioeconomic status for adolescents using material indicators of socio-economic deprivation like housing, ownership of car, type of school etc. Depending on the scores they will belong to three groups, low deprivation, medium deprivation and high deprivation.

Modified Kuppuswami scale (Sharma, 2011)

Modified Kuppuswami scale is widely used to measure the socio-economic status of an individual. It is based on three variables namely education and occupation of head of the family and per capita income per month.. This scale is intended for urban population. This scale has five classes of socioeconomic status, namely lower, upper lower, lower

middle, upper middle, and upper middle class. Modified Kuppuswami Scale is used in the current study.

Parental stress

Parental Stress scale (Berry and Jones, 1995)

This scale measures the relative stress in the parent-child relationship. It is used for early identification of dysfunctional parent-child interactions, parental stress, family functioning, and risk for child abuse and neglect. Child and family characteristics are measured .It is a 120 item self reported questionnaire that yields three scales Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child.

Parenting Daily Hassle Scale (Crinic and Greenberg, 1990)

This scale is mainly used to identify the stress in parents and the challenging behaviour of children that causes maximum stress. It is a self reported measure of 20 items that yields two scores, challenging behaviour total score and parenting task total score.

Parental Stress Scale (Berry and Jones, 1995)

The Parental Stress Scale is a self-report scale that contains 18 items representing pleasure or positive themes and negative components of parenthood .The responses are marked in a likert scale. High scores indicate more stress. It has an internal reliability of

.83, and test-retest reliability of .81. Discriminant analyses demonstrated the ability of the scale to discriminate between parents of typically developing children and parents of children with both developmental and behavioral problems. This scale is used in this study for measuring parental stress.

Family functioning

Global Assessment of Relational Functioning Scale (Yingling and Miller, 1998)

This scale is used to measure the overall adjustment of family. The functioning ranges from competent optimal relational functioning to a disrupted dysfunctional relationship. The areas that are looked into are problem solving, emotional climate and organization.

Family assessment measure (Skinner et al., 1983)

This scale is based on process model of family functioning. It consists of 3 subscales: general, dyadic relationship and self rating scale. It is a self rated scale .It provides family information for a multi-rater and multi-generational assessment of family functioning.

Family Environment Scale (Bernice and Rudolf, 2009)

It is a 90 item inventory that measures social and economic functioning of the family .It has 10 subscales measuring interpersonal dimension, personal growth and system

maintenance. This scale is used in sibling research as it can compare siblings' perceptions of their family with one another.

Family APGAR (Smilkstein, 1979)

This scale evaluates the family member's satisfaction with family relationships and thereby assesses a family member's perception of family functioning. It has five parameters of family functioning: Adaptability, Partnership, Growth, Affection, and Resolve. It is scored on a 3 point self reported likert scale, takes only a few minutes to administer. Reliability and validity scores are 0.8 and 0.8 respectively. This scale is used in the present study.

Coping

Jalowiec Coping Preference Scale (Jalowiec et al., 1984)

This is a scale for identifying the coping pattern that is used in adolescents. It is a 60-item questionnaire. While using this scale respondents mark how often they have used the strategy, and how helpful it has been to them. Responses are on likert scales, (The coping strategies are classified in to confrontative, evasive, supportant optimistic, palliative, emotive, and self-reliant. The Cronbach's alpha for the total scale was found to be 0.86 and effective index was 0.91.

Ways of Coping Scale (Folkman et al., 1986)

It is an inventory of specific ways in which people might cope with a stressful event. Individuals are asked to respond to a specific stressor (and indicate the degree to which they have utilized each particular coping method to deal with it. The eight specific coping strategies are: confrontative coping, positive appraisal, seeking social support, planful problem-solving, self-control, distancing, accepting responsibility, and escape/avoidance.

Kidcope (Spirito et al., 1987).

Kidcope is a self report scale which has 16 items that can be classified into ten cognitive and behavioural coping strategies. The coping strategies are problem solving, distraction, social support, social withdrawal, blaming self and others, cognitive restructuring, emotional expression, wishful thinking, resignation and prayer. It is an established coping scale in children's and adolescents.

Sibling relationship

Questionnaire on Sibling Relationships (Arranz et al., 2000)

This scale consists of three open questions. The responses can be grouped into positive/diffuse, negative or negative/diffuse. Scoring is based on each child's positive or negative view of sibling relationship. Score denoted as sibling adjustment rating ranges from 0 to 6 and higher scores indicate good adjustment between siblings.

Life Span Sibling Relationship Scale (Riggio, 2000)

This scale focuses on developmental relationship between siblings .It is a self report scale with 48 items and participants respond on a five point likert scale. This scale measures affect towards sibling as positivity of behavior toward sibling and beliefs about sibling and sibling relationship. This scale measure the perceived sibling compatibility.

Sibling Inventory of Behaviour (Schaefer, 1981)

It is a parental report of sibling relationship quality originally developed by Schafer et al primarily to evaluate sibling relationships. This scale has been used in many studies that have looked into sibling relationship in families with child with disability. Modified version of this scale is available which is used in the present study. The scale has 32 items and can be collapsed into has 6 subscales which includes companionship, empathy, rivalry, aggression, teaching and embarrassment. Positive and negative involvement scores can be also be obtained as second order subscales.

II.f.3. **Measure for assessing the confounders**

Life event

Modified Coddington Life Event scale (Coddington, 1971)

Originally modified by Coddington and later on modified by Sandler et al., this scale measures significant life events in terms of Life Change Units. It has three versions for

the Preschool, child and the adolescent versions. A maximum of 500 LCU can be scored. Higher the LCU score more is the risk of developing psychopathology.

*Life Events Checklist*_(Johnson and Mccutcheon, 1980).

It is a questionnaire where adolescents report the positive and negative events that had occurred in their lives in the previous year. The impact of the event is marked on a three-point likert scale. Negative life event ratings are shown to be predictive of children's level of academic achievement, anxiety and maladjustment. It was developed originally to facilitate diagnosis of Post Traumatic Stress disorder.

Life Events Scale for Indian Children (Malhotra, 1993)

It i s 50 item scale is an adaptation of British Life Inventory for Indian Population. It is a parent reported scale where each event is recorded with the date of occurrence. And the event is assigned a score between 0-100 which denotes the stressfulness of the event. Stress scores of individual events can be added to get overall life stress score. It can be done with reference to two time frames, one year before assessment or ever in life. More number of life events and higher Stress score predicts poor adjustment. It is validated for Indian socio-cultural context.

Academic stress

Student -Life Stress Inventory Scale (Gadzella, 1991)

It is a self report tool that measures the stressors faced by the students and their reactions It is a Paper and Pencil questionnaire that consist of 51 items and has 9 subscales. Stressors of five types, frustrations, conflicts, changes, pressures and self imposed are scored on a five point likert scale. The physiological, emotional, behavioural and cognitive reactions are also assessed.

Academic Anxiety Scale for Children (Singh and Sengupta, 2010)

It is intended to measure anxiety regarding academics and academic situations. It is a 20 item scale with 16 positive items and 4 negative items. The responses are either yes or no. Total score is calculated which is then converted to percentile score.

Student Academic Stress Scale (Busari, 2011)

This is a 50 item scale used to measure student responses in academic stress. It is assessed in four domains: physiological, behavioural, cognitive and affective. Children rate how much of the time they feel those symptoms in the item on a five-point Likert scale. Higher scores indicate higher stress.

II. AIMS & OBJECTIVES

III.a. Aim

To study adjustment of siblings with children having major and minor mental illness.

III.b. Objectives

1. Comparison of the of childhood major mental illness against minor mental illness on the adjustment of siblings.
2. To identify the factors predicting poor adjustment among siblings.
3. To build a predictive model for poor sibling adjustment.

III.c. Hypotheses

1. The adjustment of the siblings will be different when mentally ill child has a major mental illness when compared with a child with minor mental illness.
2. Specific predictive factors are associated with poor adjustment and can be identified.

III.d. Null hypotheses

1. The adjustment of the siblings will not be different when mentally ill child has a major mental illness when compared with a child with minor mental illness.
2. No specific predictive factors are associated with poor adjustment that can be identified.

III. METHODOLOGY

IV.a. Research design

Prospective, cross-sectional research designs was used to the compare the adjustment among sibling of children and adolescents with major and minor mental illness as well as identify the predictive factors associated with poor sibling adjustment and build a predictive model.

IV.b. Setting

The study was conducted in the Child and Adolescent Psychiatry Unit, Department of Psychiatry, Christian Medical College, Vellore, Southern India. Christian Medical College is a tertiary care, teaching referral hospital. Patients from all regions of the country and neighboring countries benefit from these facilities in the hospital. The Child and Adolescent Psychiatry unit of the Department of Psychiatry has two divisions, one for the children with developmental disorders and the other one for children with emotional as well as behavioural disorders. The division for the emotional and behavioral disorders has fifteen beds. The multidisciplinary treating team makes the clinical diagnosis based on the ICD-10 diagnostic system. The division for the developmental disorders has twenty-four beds for residential care and equal numbers of children attend the assessment as well as therapies on a daily basis. The study was conducted from March to November 2012 with the emotional and behavioural problem division of the Child and Adolescents Psychiatry Unit. At the start of the study approximately 60 new cases with major or minor mental illnesses were expected to get registered in a month. Of

these about 50% were expected to have a sibling who would satisfy the selection criteria. This group of children and adolescents with their sibling and parent(s) formed the study population.

IV.c. Selection criteria

The following selection criteria were used to select the study sample from the study participants:

Index group

Inclusion Criteria

1. Sibling aged 7-18 years of a child with major mental illness (ICD-10 diagnosis of psychoses, mood) with a sibling.
2. Either mother or father (the primary care-giver) of a child with major mental illness (ICD-10 diagnosis of psychoses, mood) with a sibling.

Exclusion criteria

1. Siblings and parents of children with more than one family member having mental illness were excluded.
2. Siblings and parents of children developmental disabilities were excluded. The presence of developmental disabilities and mental illness among other family members were ruled out historically from the informant parent.
3. Siblings or parents with known mental illness or developmental disabilities or life threatening physical illnesses. The presence of developmental disabilities and mental illness were ruled out clinically.

4. Parents who did not have a working knowledge of Tamil, Malayalam, Hindi or English.

Control group

Inclusion Criteria

1. Sibling aged 7-18 years of a child with minor mental illness (ICD-10 diagnosis of psychoses, mood) with a sibling.
2. Either mother or father (the primary care-giver) of a child with minor mental illness (ICD-10 diagnosis of somatoform disorder, dissociative disorders, Disruptive disorders Anxiety disorders).

Exclusion criteria

1. Siblings aged less than 7 years and more than 18 years were excluded.
2. Siblings and parents of children with more than one family member having mental illness were excluded.
3. Siblings and parents of children developmental disabilities were excluded. The presence of developmental disabilities and mental illness among other family members were ruled out historically from the informant parent.
4. Siblings or parents with known mental illness or developmental disabilities or life threatening physical illnesses. The presence of developmental disabilities and mental illness were ruled out clinically.
5. Parents who did not have a working knowledge of Tamil, Malayalam, Hindi or English.

IV.d. Sampling technique

Using the selection criteria a purposive sampling technique was used to select the study samples. Thus consecutive children and adolescents with their siblings and parents who fulfilled the respective selection criteria were included for the study till the required sample size was recruited in major and minor mental illness arm.

IV.e. Sample size

The sample size was calculated based on the multiple regression analysis that was required for identifying the predictive factors for the poor sibling adjustment. For 15 predictive variables in the equation, with an anticipated effect size (f^2) of adjustment score between groups as 0.15, desired statistical power of 0.8 and level of significance at 0.05, the minimum sample size required was 139. Thus in each arm, of the major and minor mental illness group, 70 siblings were planned to be recruited.

IV.f. Variables studied

Classification of illness as major and minor illness

This diagnosis was based on the International Classification of Diseases (Version Ten) (ICD-10) diagnosis (WHO, 1992). All the F20 and F30 categories and subcategories were considered as major mental illness and the rest were considered as minor mental illness. All the developmental disorders were not included in the diagnostic classification as per the exclusion criteria. ICD-10 was used as the reference standard as it has proven international, standard diagnostic classification utility in general practice and research.

Dependent variable for predictive factor of poor sibling adjustment

The adjustment of the sibling as measured by Preadolescent Adjustment Scale and dichotomised as 'good' and 'poor' adjustment was the primary measure for the dependent variable and Child adjustment Scale was the secondary measure for the dependent variable.

Independent variables for the predictive factors of poor sibling adjustment

Four clusters of independent variables were studied.

(i) Child factors

1. Chronological age (continuous variable in months as informed by sibling or parent)
2. Sex (categorical).
3. Socioeconomic status (categorical variable as assessed by Modified Kuppusamy Socio-economic scale).
4. Diagnosis (categorical ICD-10 diagnosis as made by the multidisciplinary treating team)
5. Duration of illness (continuous variable in months as informed by sibling or parent).

(ii) Sibling factors

6. Chronological age (continuous variable in months as informed by sibling or parent).
7. Sex (categorical).
8. Birth order (categorical as informed by the sibling or parent).
9. Educational level (categorical as informed by the sibling or parent).
10. Sibling relationship (as measured by Sibling Relationship Inventory-parent rating)

11. Coping (categorical as assessed by as measured by Kidcope).

(iii) Family factors

12. Family functioning (continuous variable as assessed by Family APGAR score).

13. Parental stress (Parental Stress Scale).

(iv) Supra-system factors

14. Life event (continuous variable as assessed by Life events scale for Indian children).

15. Academic stress (continuous variable as assessed by Academic Stress Scale).

IV.g. Measures used

Information on the demographic that were not measured with a standard instrument like age and gender were collected using a special data collecting proforma designed for the study (Appendix I).

The other standard measures administered for the dependent variable and various independent variables are discussed here briefly.

Pre adolescent adjustment scale (Pareek and Rao, 1975)

This scale has 40 items to which child answers either yes or no. It measures the adjustment of child towards home, school, teachers, peers and general issues. Each item has a particular score and scores of subscales are obtained by adding the scores for the items checked affirmative in that group. Total score is obtained by adding up the subscale

scores. The scores range from -46 to 34. High positive scores indicate good adjustment in that area, while negative scores indicate maladjustment. Scores near zero indicates mild adjustment or maladjustment depending on the magnitude and direction of the score. Even though this scale is developed for pre-adolescents, it can be used for adolescents also and has been used in few studies (Appendix II).

Child adjustment scale (Santrock and Warshak, 1979)

This scale measures children's socio-emotional adjustment. It has four subscales: Peer relations, work habits, emotional health and compliance. Parent rates on a five point likert scale. Subscale items are given and the items are added to get a score for each subscale total score is obtained by adding the subscale scores. Higher score indicates good adjustment (Appendix III).

Modified Kuppuswami scale (Sharma, 2011)

Modified Kuppuswami scale is widely used to measure the socio-economic status of an individual .It is based on three variables namely education and occupation of head of the family and *per capita* income per month.. This scale is intended for urban population. This scale has five classes of socioeconomic status, namely lower, upper lower, lower middle, upper middle, and upper middle class (Appendix IV).

Parental stress scale (Berry and Jones, 1995)

The Parental Stress Scale is a self-report scale that contains 18 items representing pleasure or positive themes and negative components of parenthood .The responses are

marked in a likert scale. High scores indicate more stress. It has an internal reliability of .83, and test-retest reliability .81. Discriminant analyses demonstrated the ability of the scale to discriminate between parents of typically developing children and parents of children with both developmental and behavioral problems (Appendix V).

Family APGAR (Smilkstein, 1979)

This scale evaluates the family members satisfaction with family relationships and thereby assess a family members perception of family functioning. It has five parameters of family functioning: Adaptability, Partnership, Growth, Affection, and Resolve. It is scored on a 3 point self reported likert scale, takes only a few minutes to administer. The score ranges from 3-10. Reliability and validity scores are 0.8 and 0.8 respectively (Appendix VI).

Kidcope (Spirito et al., 1987)

Kidcope is a self report scale which has 16 items that can be classified into ten cognitive and behavioural coping strategies. The coping strategies are problem solving, distraction, social support, social withdrawal, blaming self and others, cognitive restructuring, emotional expression, wishful thinking, resignation and prayer. It is an established coping scale for use in children and adolescents. There is also a parent version available. To score this, child is asked to express how he feels in a stressful situation of living with a sibling. The sibling is asked to mark ho nervous or sad or angry he feels in such a situation on a five point likert scale. After that he is shown the list of coping strategies and asks him to whether he uses that style to cope. It gives the frequency scale and how much it helps on a

score of 1 to 3 gives us efficacy score. We have used only frequency scores in this study (Appendix VII).

Sibling relationship inventory (Schaefer, 1981)

It is a parental report of sibling relationship quality originally developed by Schafer et al primarily to evaluate sibling relationships. This scale has been used in many studies that have looked into sibling relationship in families with child with disability. Modified version of this scale is available which is used in the present study. The scale has 32 items and can be collapsed into has 6 subscales which includes companionship, empathy, rivalry, aggression, teaching and embarrassment. Positive and negative involvement scores can be also be obtained .Scores on negative qualities are reverse scored and then added. High total score is suggestive of good attitude to the ill sibling (Appendix VIII).

Life events scale for Indian children (Malhotra.S, 1993)

This 50-item scale is an adaptation of British Life Inventory for Indian Population. It is a parent reported scale where each event is recorded with the date of occurrence. And the event is assigned a score between 0-100 which denotes the stressfulness of the event. Stress scores of individual events can be added to get overall life stress score. t can be done with reference to two time frames, one year before assessment or ever in life. There is an option of calculating subjective stress score by adding up the stressfulness scores which are the subjective scores of each event. More number of life events and higher Stress score predicts poor adjustment. It is validated for Indian socio-cultural context (Appendix IX).

Student Academic stress scale (Busari, 2011)

This is a 50 item scale used to measure student responses in academic stress. It is assessed in four domains: Physiological, behavioural, cognitive and affective. Children rate how much of the time they feel those symptoms in the item on a five point likert scale. Higher scores indicate higher stress (Appendix X).

IV.h. Interview and Data collection

Consecutive children and adolescents who were diagnosed to have either major or minor mental illness with a sibling in the Child and Adolescent Psychiatry Unit and satisfied the selection criteria were recruited for the study. All the ICD-10 diagnosis among the children and adolescents coming to the unit were made by the treating team independent of the other researchers involved in this study. Based on the diagnosis a researcher independently classified the children and adolescents as having major and minor mental illness as decided *a priori*. The same day the primary investigator collected the rest of the research data. This data collection protocol required approximately 4 hour to complete, consisted of a face-to-face interview with both open ended questions and fixed response items on demography, socioeconomic factor, child related factors, parent related factors, family related factors, life event related factor. These informations were collected from multiple sources, namely the child and parent(s).

IV.i. Statistical methods

As part of the data analysis, preliminary checks of skewness verified that our data were suitable for parametric analysis. The analyses were carried out at three levels for the first hypothesis. Firstly, the descriptive analysis and comparison between groups with independent student's t test and Chi-square with Yates correction was done to compare the continuous and categorical factors respectively between the major and minor mental illness groups for describing the participant characteristics and for proving the first hypothesis. Secondly for proving the second hypothesis, univariate regression analyses were performed for all predictive factors against the dependent variable (dichotomized sibling adjustment of poor and good adjustment based on the Preadolescent Adjustment scale median) with constant in the equation. Thirdly, adjusted analysis was done for all predictive factors found significant in the bivariate analyses with life event and academic stress as confounder for sibling adjustment using multivariate logistic regression analyses. Finally, a parsimonious model predicting the risk factors was built using the multiple regression analyses. A significance level of 0.05 and 2-tailed tests were used unless otherwise noted because of the nature of the study hypotheses. Data was analyzed using the software package of SPSS (version 19).

IV.j. Ethical considerations

The ethical concerns of this study were addressed using the following measures:

1. Written informed consent from the parent (Appendix XI and Appendix XII) for participating in the study.
2. Verbal assent from the child or adolescent with mental illness and the sibling for participating in the study, whenever possible, was obtained to ensure voluntary participation (Appendix XIII).
3. Reversible anonymisation as well as restricted access and disclosure of the obtained data ensured the privacy of patients.
4. The local Institutional Review Board of Christian Medical College had reviewed and provided approval for the study.

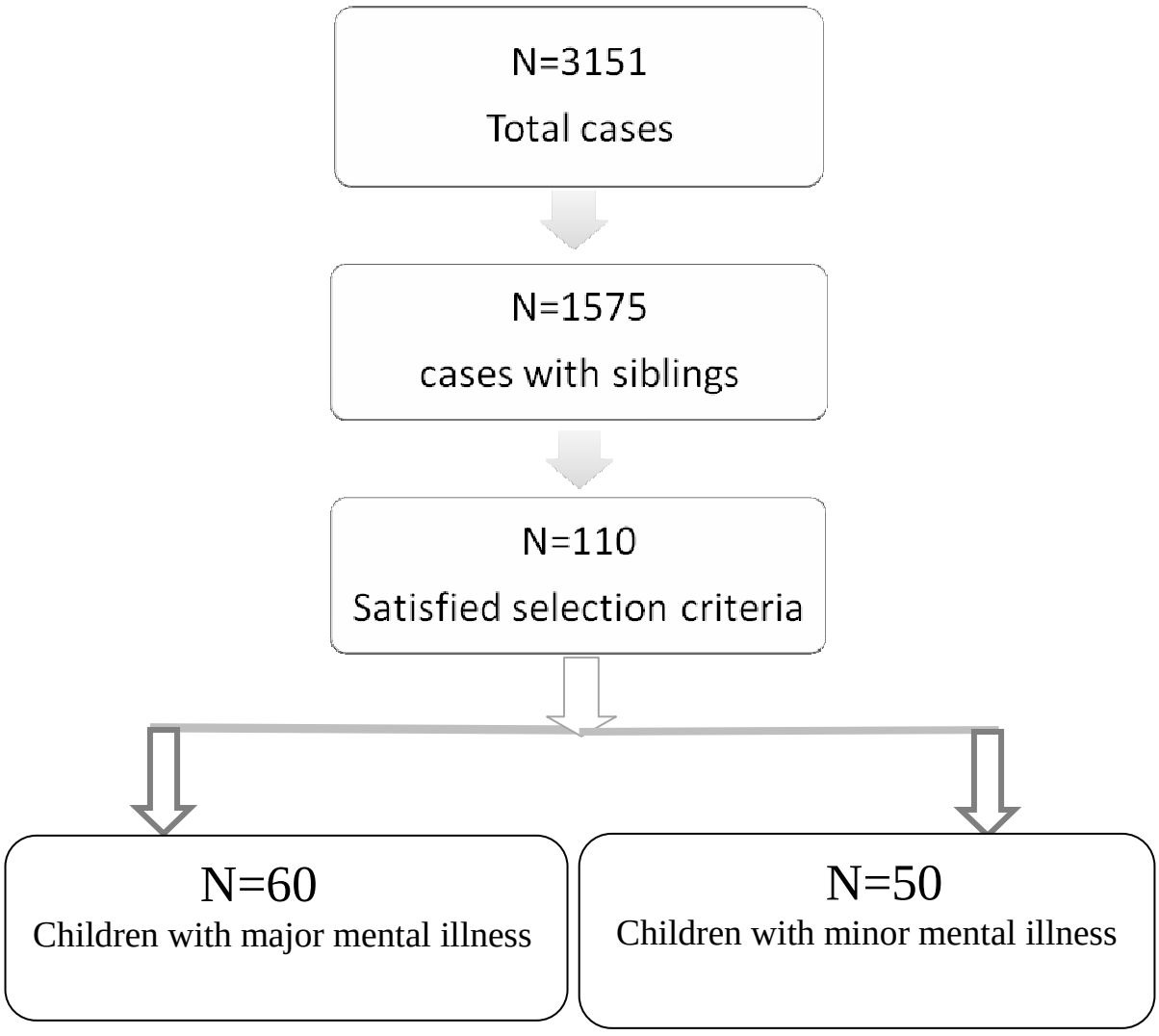
IV. RESULTS

The results are discussed in the following headings of participant flow; participant characteristics, participant characteristics; differences in characteristics between the major and minor mental illness groups; differences in adjustment between siblings; predictive factors associated with poor adjustment among siblings; predictive modeling for poor adjustment among siblings.

V.a. Participant flow

The participant flow is depicted in figure 1.

Figure 1: Participant flow



In the sample there was male preponderance with a mean (sd) chronological age of 171.87(39.41). Majority of the participants were from the middle socio-economic status. The mean duration of the illness was shorter than 2 years but much more than 1 year.

Table 1: Patient, parent and family characteristics for the whole sample

Variables (N=110)	**N(%)/ mean (sd)**
Gender of child	
Male	60(54.5)
Female	50(45.5)
Socio-economic status	
Upper class	18(16.4)
Upper middle class	30(27.3)
Lower middle class	22(20)
Upper lower class	36(32.7)
Lower class	4(3.6)
Type of Psychiatric Disorder	
Major Psychiatric Disorder	60(54.5)
Minor Psychiatric Disorder	50(45.5)
Chorological age of child (month)	171.87(39.41)
Duration of illness (month)	19.27(18.78)
Parental stress	42.17(9.32)
Family functioning	8.45(2.20)

The mean (sd) of Parental Stress Score was 42.17 (9.32) and family functioning as measured by Family APGAR was 8.45 (2.20) (Table 1).

Table 2: Sibling characteristics for the whole sample

Variables (N=110)	N (%)
Gender of sibling	
Male	44(40)
Female	66(60)
Education of sibling	
Lower Primary School	25(22.7)
Upper Primary School	64(58.2)
High School	17(15.5)
Higher Secondary School	3(2.7)
Chorological age of sibling	154.56(35.52)
Quality of relationship between siblings	
Total score	125 (20.020)
Compassion	23.60(6.98)
Empathy	21.48(4.91)
Teaching	12.98(5.10)
Rivalry	26.33(7.59)
Aggression	16.95(4.76)
Embarrassment	23.58(3.59)
Sibling's type of coping	
Distraction	83(75.5)
Social withdrawal	35(31.8)
Cognitive restructuring	20(18.2)

Self-criticism	9(8.2)
Blaming others	8(7.3)
Problem solving	47(42.7)
Emotional regulation	24(21.8)
Wishful thinking	41(37.3)
Social support	79(71.8)
Resignation	18(16.4)
Praying	61(55.5)
Academic stress	84.12(32.66)
Life stress score	235.19(103.13)
Kidcope frequency	
1 coping style	14(12.7)
2 coping styles	22(20)
3 coping styles	20(18.2)
4 coping styles	20(18.2)
5 coping styles	7(6.4)
6 coping styles	5(4.5)
7 coping styles	7(6.4)
8 coping styles	5(4.5)
9 coping styles	7(6.4)
10 coping styles	1(.9)

However, there was a female preponderance among the siblings and had a mean (sd) chronological age of 154.56(35.52) months. Majority of the siblings have completed there primary schooling. Lack of rivalry, lack of embarrassment and presence of compassion were noted more among the sibling relationship. Distraction followed by social support, praying, problem solving and wishful thinking in that order were the most common coping styles used by the siblings. Majority of the siblings used one to four different types of coping styles. The mean (sd) for the Academic Stress Scale score and Life Stress Score collected for the past one year was 84.12(32.66) and 235.19(103.13) respectively (Table 2).

V.c.<u>Difference in the patient, parent and family characteristics between groups</u>

Table 3: Difference in patient, parent and family characteristics between those with minor and major psychiatric disorders

Variables	Major PD (N=60)	Minor PD (N=50)	Statistics χ^2, t	P value
Chorological age of child	188.92(22.675)	151.42(45.331)	5.32	0.001
Gender of child				
Male	33(30%)	27(24.5%)	0.011	0.9
Female	27(24.5%)	23(20.9%)		
Socio-economic status				
Upper class	6(5.5%)	12(10.9%)		
Upper middle class	12(10.9%)	18(16.4%)	15.255	0.004
Lower middle class	13(11.8%)	9(8.2%)		
Upper lower class	28(25.5%)	8(7.3%)		
Lower class	1((.9%)	3(2.7%)		
Duration of illness	17.52(17.035)	21.38(20.673)	-1.075	0.2
Parental stress	42.4667(9.92765)	41.8200(8.63238)	0.361	0.7
Family functioning	8.32(2.228)	8.62(2.194)	-0.716	0.4

As seen in Table 3, there was statistically significant difference in the chronological age of those who had minor and major mental illnesses. Thos with major mental illness were

older by age. Also, there were more siblings from the lower middle and upper lower socio-economic status in the major mental illness group. However there was no statistical difference when gender, duration of illness, parental stress score and family functioning score between the two groups.

Table 4: Difference in sibling characteristics between those with minor and major psychiatric disorders

Variables	Major PD (N=60) N (%)	Minor PD (N=50) N (%)	Statistics χ^2, t	P value
Chorological age of sibling	166.15(30.972)	140.66(35.917)	3.997	0.001
Gender of sibling				
Male	28(25.5)	16(14.5)	2.444	0.1
female	32(29.15)	34(30.9)		
Education of sibling				
Lower Primary School	6(5.5)	14(12.7)		
Upper Primary School	8(7.3)	13(11.8)	11.270	0.01
High School	31(28.2)	15(13.6)		
Higher Secondary School	15(54.5)	8(7.3)		

Quality of relationship between siblings				
Compassion	23.28(7.37)	23.98(6.53)	-0.525	0.6
Empathy	21.37(5.25)	21.62(4.54)	-0.271	0.7
Teaching	13.07(5.31)	12.88(4.90)	0.191	0.8
Rivalry	27.30(7.47)	25.16(7.64)	1.478	0.1
Aggression	17.23(5.21)	16.60(4.18)	0.693	0.4
Embarrassment	24.07(2.52)	23.00(4.50)	1.490	0.1
Sibling's type of coping				
Distraction	48(43.6)	35(31.8)	1.473	0.2
Social withdrawal	19(54.3)	16(14.5)	0.001	0.9
Cognitive restructuring	10(9.1)	10(9.1)	0.204	0.6
Self-criticism	7(6.4)	2(1.8)	2.134	0.1
Blaming others	4(3.6)	4(3.6)	0.072	0.7
Problem solving	30(27.3)	17(15.5)	2.853	0.09
Emotional regulation	13(11.8)	11(10)	0.002	0.9
Wishful thinking	23(20.9)	18(16.4)	0.064	0.8
Social support	41(37.3)	38(34.5)	0.792	0.3
Resignation	12(10.9)	7(6.4)	0.687	0.4
Praying	34(30.9)	27(24.5)	0.079	0.7
Academic stress score	90.5833(36.20)	75.88(25.77)	2.481	0.01
Life Stress score	233.33(103.88)	238.12(102.86)	-0.242	0.8

Chronological age, education, academic stress was statistically different between the major and minor mental illnesses. There was trend towards a statistical difference in the use of problem solving as the coping style between the groups. Chronological age of the siblings was higher in the major mental illness group, and similarly most of the siblings in the major mental illness were noted to be in high school. Furthermore, the academic stress among those with siblings with major mental illness was higher. More siblings in the major mental illness group has used problem solving as their coping style as against those in the minor mental illness group although it showed only a trend. There was no statistically significant difference between groups in any other coping style used; gender, quality of relationship between siblings and the life stress score (Table 4).

V.d. Adjustment among siblings

Table 5: Adjustment among siblings for the whole sample

Variables (N=110)	N (%)
Pre-adolescent Adjustment Scale	
Total Score	18.06(11.38)
Home	5.24(4.79)
School	3.63(3.15)
Peer	4.48(2.56)
Teachers	2.69(3.72)
General	2.07(2.89)
Child Adjustment Scale	
Total Score	123.55(15.48)
Peer	50.23(7.09)
Work habits	37.01(6.25)
Emotional health	24.69(4.08)
Compliance	11.61(3.25)

In the bivariate analyses, the mean (sd) of the Pre-adolescent Adjustment Scale and Child Adjustment Scale was 18.06(11.38) and 123.55(15.48) respectively. The subscale scores for both the Pre-adolescent Adjustment Scale and Child Adjustment Scale are given in Table 5.

However, when the total and subscales of Pre-adolescent Adjustment Scale and Child Adjustment Scale were compared between the major and minor mental illness groups

there were statistically significant differences in the Pre-adolescent Adjustment Scale but not in the Child Adjustment Scale. The difference between the groups in the Pre-adolescent Adjustment Scale was at P=0.023, while the subscales of that measure the adjustment with the teachers and general adjustment was significantly different at P=0.015 and 0.057 respectively (Table 6). The Pre-adolescent Adjustment Scale Scores were also note to be spread across the score range in the major mental illness group unlike in the minor mental illness group where fewer siblings score but higher (Figure 2).

Table 6: Adjustment among siblings of children with minor and major psychiatric disorders

Variables	**Major PD (N=60)**	**Minor PD (N=50)**	**Statistics $\chi 2$, t**	**P value**
Pre-adolescent Adjustment Scale Total Score	15.9(13.18)	20.66(8.14)	-2.316.023	0.02
Home	4.87(5.30)	5.68(4.08)	-0.887	0.3
School	3.23(3.62)	4.12(2.43)	-1.528	0.1
Peer	4.31(2.77)	4.68(2.29)	-0.740	0.4
Teachers	1.93(4.24)	3.60(2.75)	-2.482	0.01
General	1.55(2.94)	2.60(8.14)	-1.920	0.05
Child Adjustment Scale Total Score	124.40(17.261)	122.54(13.129)	0.641	0.5
Peer	50.61(7.590	49.78(6.48)	0.623	0.5
Work habits	37.15(6.78)	36.84(5.60)	0.262	0.7
Emotional health	25.02(4.20)	24.30(3.93)	0.922	0.3
Compliance	11.62(3.49)	11.62(2.98)	-0.005	0.9

Figure 2: Spread of Pre-adolescent Adjustment Scale Score in major and minor mental illness groups.

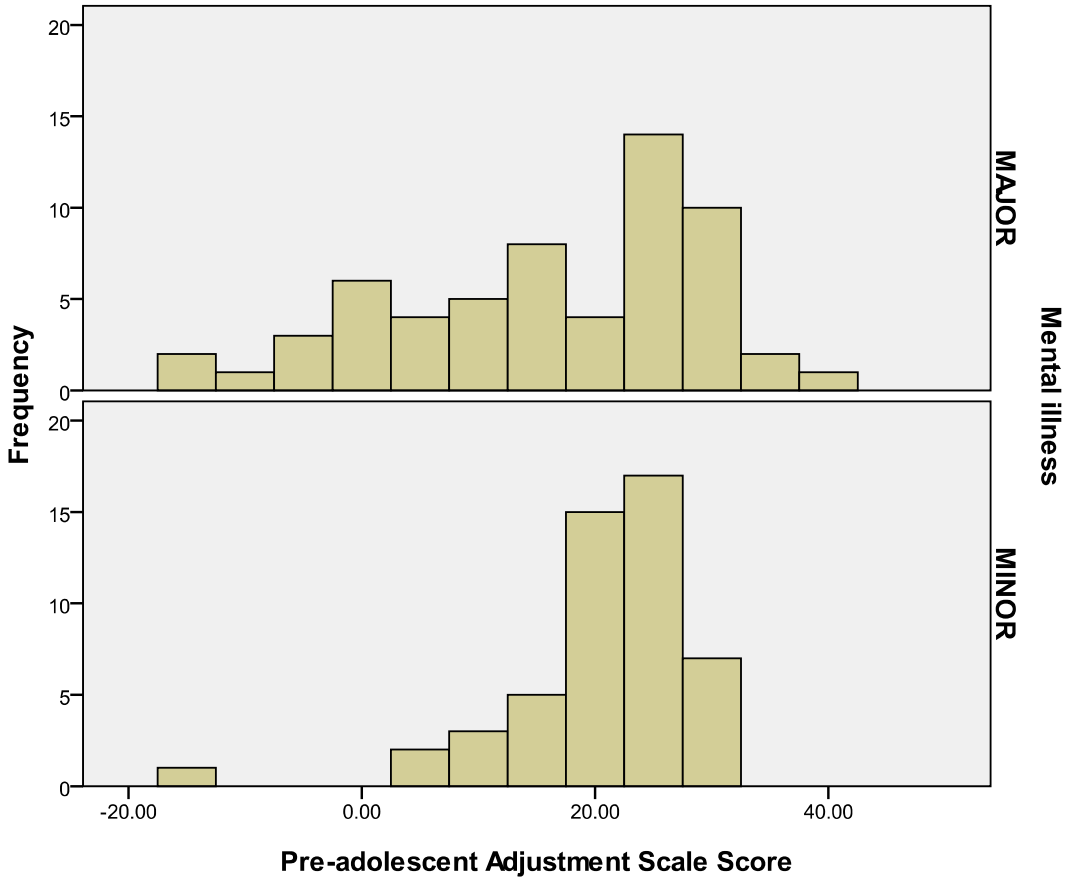


Table 7: Adjustment among siblings of children with minor and major psychiatric disorders after controlling for the confounders.

Variables	B(SE)	t	P value	R^2
Pre-adolescent Adjustment Scale Total Score	1.305(1.62)	0.802	0.4	0.486
Home	-.065(0.873)	-0.074	0.9	0.164
School	0.182(0.546)	0.333	0.7	0.246
Peer	0.243(0.505)	0.481	0.6	0.019
Teachers	0.691(0.573)	1.207	0.2	0.404
General	0.278(0.447)	0.622	0.5	0.400
Child Adjustment Scale Total Score	-4.443(2.803)	-1.585	0.1	0.176
Peer	-1.720(1.329)	-1.294	0.1	0.117
Work habits	-1.455(1.115)	-1.305	0.1	0.200
Emotional health	-1.218(0.782)	-1.558	0.1	0.079
Compliance	-0.051(0.647)	-0.079	0.9	0.007

[a] = controlled for academic stress and life events.

In the multivariate linear regression analyses while controlling for the confounding effect of academic stress and life stress score due to life events, all the statistical difference that was noted between the groups did not continue to be significant. This was because the academic stress significantly contributed to the adjustment difficulty among the siblings (Table 7).

V.e. Predictive factors associated with poor adjustment

Table 8: Predictive factors for good and poor sibling adjustment based on the dichotomized Pre-adolescent Adjustment Scale Total Score as the dependent variable

Variable	Unadjusted OR	df	P Value	Adjusted OR[a]	95% CI for OR	P Value
Chronological age of patient	0.989	1	0.041	0.993	0.982-1.005	0.2
Chronological age of sibling	0.988	1	0.039	0.995	0.983-1.008	0.4
Socio-economic status	0.680	1	0.024	0.689	0.466-1.018	0.06
Education of sibling	0.775	1	0.186	1.028	0.664-1.592	0.9
Problem solving coping	2.293	1	0.035	5.485	1.855-16.223	0.002

[a]= adjusted for academic stressors and life events.

In the univariate logistic regression analyses to identify the predictive factors associated with poor sibling adjustment the factors of chronological age of patient and sibling, socio-economic status and the use of the problem solving coping were related to poor adjustment. However, when the confounding effect of the adjusted for academic stressors and life events were controlled for in the multivariate logistic regression, only the use of the problem solving coping was related to poor adjustment while the socio-economic status showed a trend towards predicting poor adjustment. Siblings using problem solving coping were at a 5-fold risk (OR=5.485) of developing poor adjustment to the sibling having any form of mental illness (Table 8).

V.f. Predictive model for poor adjustment

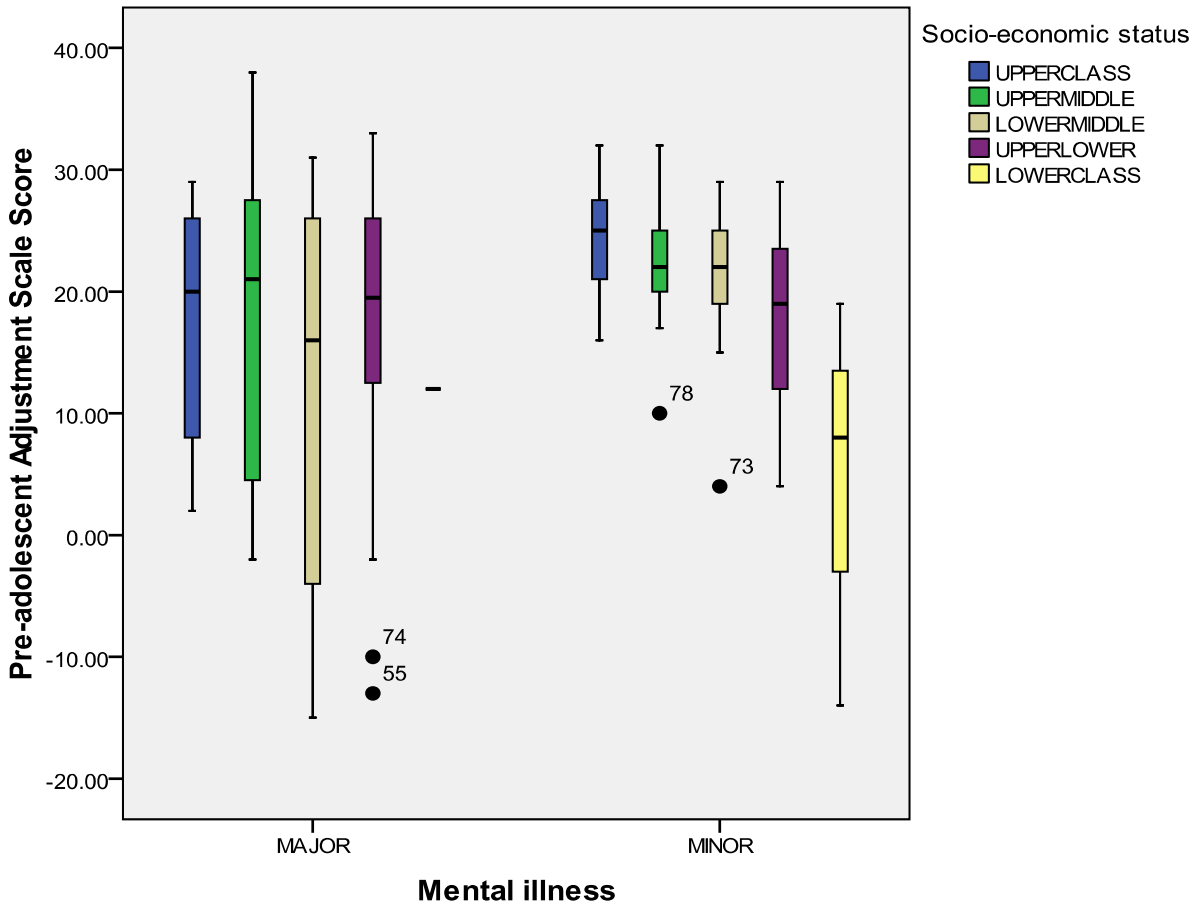
Table 9: The parsimonious model that predicts poor adjustment among siblings with either major or minor mental illness

Variable	B (SE)	df	P value	OR	95% CI for OR	
					Lower	Upper
Chronological age of patient	-0.008 (0.006)	1	0.1	0.99	0.980	1.004
Chronological age of sibling	-0.009 (0.007)	1	0.2	0.99	0.978	1.005
Socio-economic status	-0.319 (0.185)	1	0.08	0.72	0.506	1.045
Problem solving coping	1.135 (0.437)	1	0.009	3.11	1.322	7.322

The model building was done with multivariate regression analyses, where the dichotomized adjustment of siblings, as good and poor adjustment was taken as the outcome variable. All the variables that came significant in the univariate logistic regression analyses in the previous step predicting the association between poor adjustment of sibling were taken as independent predictive factors and analysed. Only using problem solving coping style was significantly predicting the presence of poor adjustment among sibling irrespective of the sibling having major or minor mental illness. Those siblings using problem solving coping style were more than 3-fold at risk (OR= 3.111) for developing poor adjustment.

Also, socio-economic status contributed to the predictive model but not statistically significantly. There was a differential negative relationship between the socio-economic status and poor adjustment. The lower the socio-economic status less is the chance of having poor adjustment among siblings, thus low socio-economic status can be taken as protective (OR=.0.727). However, when the differential relation was further explored (Figure 3), it showed that the median score for poor adjustment among the siblings in the major mental illness group was highest in the upper middle class followed by upper class, lower middle, upper lower and finally the lower class. However, for the minor mental illness the poor adjustment score was the highest for the upper class, followed by lower middle, upper middle, upper lower and finally the lower class. In each group there were two siblings with a Pre-adolescent Adjustment Scale score that was less than 3/2 of the lower quartile (Figure 3).

Figure 3: Box and whisker plot depicting the role of socio-economic status in the sibling adjustment among major and minor mental illness groups



V. DISCUSSION

This is the first prospective cross-sectional study, which documented the adjustment of siblings among those children and adolescents with major and minor mental illness, as well as studied the risk factors for poor sibling adjustment while controlling for the confounding effect of life events and academic stress in the Indian population. The significant findings are that firstly, there is a significant difference in the total and some of the subscales of the adjustment among the siblings. Secondly, there is a set of specific predictive factors associated with the poor adjustment among the siblings of children with mental illness. Thus with these findings the two hypotheses of this study stands proven. These findings are further discussed under the headings of participant flow; participant characteristics; differences in characteristics between the major and minor mental illness groups; differences in adjustment between siblings; predictive factors associated with poor adjustment among siblings; predictive modeling for poor adjustment among siblings; strengths of the study; weaknesses of the study; clinical implications and future directions.

VI.a. Participant flow

Among patients who came to Child and Adolescent Psychiatry Unit from April 2012 to November 2012, as estimated almost 50 % of the children with a mental illness had siblings. This sibship estimation reflects the national trend. Despite this initial estimate we could recruit only 110 siblings following the stringent selection criteria to enable a

purposive sampling and thus two homogenous groups for this research. Even otherwise, researchers have admitted that recruiting siblings in to a study is a challenging task (Stålberg et al., 2004). There are many barriers to consenting to research involving mentally ill. As evident in the literature review by Woodall et al (2000) transportation difficulties, distrust or fear of research being conducted, personal inconveniences and stigma of mental illness are some of the many barriers participation of siblings in research.

Siblings of children with major mental illness were the majority in this study. This mild preponderance we see in the major mental illness group has been documented before elsewhere. Firstly, sibling research has shown that there is a fear of heredity in parents and siblings of children with major mental illness, that the sibling also might inherit the illness (Stålberg et al., 2004) and a contact with the health professional would help them to ease their concern. Secondly, the impairing or distressing nature of symptoms associated with major mental illness encourages parents to seek mental health consultation and thus the increased possibility of recruitment. Thirdly, as the study was done in a tertiary care teaching hospital, known for treating complicated cases, a referral bias where major mental illnesses are referred by other clinicians also might have resulted in more participants with major mental illness.

VI.b. Participant characteristics

Majority of the index patients were boys as expected, as boys are more prone for mental illness in childhood and adolescence. Also, a boy with mental illness is more readily taken for a mental health consultation than a girl in India. This could be because, boys have an exalted position in the Indian society and are the main wage earners and therefore family resources are being used for helping boys with mental health concerns. It could also be speculated as a consultation of a girl with mental illness can bring down her standing in the marriage market because of the stigma associated with mental illness in India. There is a preponderance of female sex among siblings. This might be simply due to chance or it can be due to the fact that sisters are more empathetic and caring towards the sibling (Labay and Walco, 2004), and hence willingly came to the hospital.

The parental stress score was lower than expected when compared to other studies in the overall sample, even when compared with the studies that have used the same scale (Yeo and Lu, 2012), the scores are lower (mean score of 56.2 versus in study by Yeo versus mean score of 42.46 in our study). This can be explained by duration of illness, which was more than one year and also by the fact that the previous studies were in school setting unlike the present clinical study. These children were in treatment for a while and family might have adjusted and adapted to the stress of ill child during the time of interview.

Family functioning was also better when compared to study by Barnatt and Hunter (2011) (mean score of 2.1 using Family Assessment device that suggests dysfunction

versus mean score of 8.45 using family APGAR that suggests functional family). The reason for this is speculated to be due to the tolerance and understanding of family members in the Indian culture.

Sibling relationship was also found to be good with presence of compassion and lack of rivalry and embarrassment. This is not in accordance with the studies that demonstrated poor relationship among siblings of developmentally ill (Bågenholm and Gillberg 1991) or physically ill children (Mancuso et al., 2003). This could be because of the fact that mental illness erupts in an already well established relationship in the Indian families

The academic stress was used as a confounder for the siblings stress rather than as a predictive factor although it can also function as a predictive factor for poor adjustment among siblings.

VI.c. Differences in characteristics between the major and minor mental illness

In our study, those with major mental illness were older in age, which is also expected as older children are more prone for developing major mental illness. Similarly, most of the siblings of major mental illness belonged to low socioeconomic status which is consistent with the literatures showing low socioeconomic status as a risk factor for development of major mental illness and adjustment problems (Kuruvilla and Jacob 2007).

In the current study, academic stress when compared between the groups was found higher in the major mental illness group. This might be a result of less parental

involvement and attention to studies of these children or that they might have more care giving responsibilities at home (Thompson et al., 1994). Academic stress also could be a result of stress involved in living with a mentally ill sibling, externalizing and internalizing problems can manifest as academic difficulties.

In our study, there is no statistical significant difference in the influence gender on the adjustment of the siblings in both groups. This goes against majority of the research evidence that gender do influence the adjustment of sibling. In a study among siblings of developmentally disabled children Macks et al (2007) and Hannah et al (1999) implicated male gender to be a risk factor. On the other hand McHale and his colleagues (1989) reported that female gender is at increased risk. Even in siblings of physically ill children, male gender is a risk factor. However our findings are in accordance with the study conducted on siblings of mentally ill children by Kilmer et al. (2008) where gender differences in adjustment was not noted.

Our study has also shown that there was statistically significant difference between the age of sibling between two groups. Siblings of children with major mental illness are older than siblings of children with minor mental illness. Similar results were also obtained in studies of siblings of physically ill children (Houtzager et al., 1999), and developmentally ill children (Roeyers and Mycke 1995; Rodrigue et al., 1993). More importantly, results were similar in study of siblings of children with severe mentally illness by Kilmer et al. (2008). However, this goes against reports of younger children being more at risk as seen in studies by Williams et al., (1997) and Hastings et al., (2003)

in studies of siblings of physically and developmentally ill children. Siblings of children with major mental illness belonged to lower socioeconomic classes. This finding is in accordance with studies that have identified poverty or low socioeconomic status a risk factor for developing major mental illness (Kuruvilla and Jacob, 2007).

VI.d. Differences in adjustment between siblings

In this study the bivariate analysis showed that adjustment scores were significantly lower for the siblings of major mental illness. However when adjusted for confounders there was no significant difference between the two groups. This is consistent with study by Barnett and Hunter (2011) where diagnosis and severity did not correlate with the adjustment. Similar results were also obtained by researchers who looked into the adjustment of siblings of physically ill (Lobato and Kao, 2002; Breslau et al., 1981), but conflicting with that of siblings of developmentally ill (Rossister and Sharpe, 2001; Dyson, 1999). More than the diagnosis and severity it might be the day to day hassles (Davis and Davis, 2010) that affects the adjustment which can be similar for major and minor mental illness.

In the bivariate analysis, there was a difference in the adjustment reported by the siblings from those perceived by the parents. While siblings themselves reported poor adjustment, parents did not report any adjustment difficulties. This is in contrast with many studies where they reported that pa rent reports of sibling adjustment are more negative (Rossister and Sharpe, 2001; Hodapp et al., 1997; Jackson et al., 2008). This might be due to increased tolerance to the children's externalizing or internalizing bahaviours by

Indian parents. This might also be an unconscious defensive technique to report good adjustment as they are worried about another child getting a diagnostic label, also considering the poor resources available.

VI.e. Predictive factors for poor adjustment among siblings

There is a trend for problem solving as the coping style used among siblings of major mental illness. What that is surprising in this study is that problem solving as the coping style is actually protective in western studies(Brown et al., 1986; Fields and Prinz, 1997). It is known that children of older age group use more of problem solving style of coping (Skinner et al., 2003). Considering that siblings of major mental illness were older compare to those of minor mental illness group, use of problem solving is only a function of age. Another reason could be the emotional behaviour nature of the problem discussed here. Studies have shown that problem solving coping negatively correlated with emotional/behaviour problems (Compas et al., 1988). Problem solving coping can be adaptive only in controllable situations (Donaldson et al., 2000; Altshuler and Ruble, 1989). It is possible that children might view the situation of living with a mentally ill sibling largely uncontrollable and hence problem solving coping may not be helpful and cause more distress

Low socio economic status as a protective factor against poor adjustment. This is conflicting with the evidence that children from low socioeconomic status are prone for adjustment problems(Patel et al., 2008). This can be explained using a psychological

concept-“Shift and persist approach” in dealing with demand in life which is beneficial for people from low socioeconomic status (Chen et al., 2012). It entails both shifting (adjusting oneself to stressors through cognitive reappraisal and emotional regulation) and persisting (enduring life with strength by holding on to hopes for future). This approach is not protective for those from high socioeconomic status. Children from low socio-economic status are exposed to multiple risk factors from young age that make them resilient and thus confers protection against further stressors.

Even though there are few studies (McHale and Gamble, 1989; Barlow and Ellard, 2006) that have shown that diagnosis and duration of illness may have an impact on the adjustment of sibling, most of studies have not supported this finding (Williams, 1997; Breslau et al., 1981; Lobato and Kao 2002). Meta-analysis done by Sharpe and Rossiter (2001) also did not show this finding.

In study of siblings of mentally ill children, Barnett and Hunter (2011) did not report any impact of diagnosis and severity of illness on the adjustment of the sibling. Our results also suggest that diagnosis and severity of the child will not affect the adjustment of the sibling.

Majority of children used emotional regulation and wishful thinking followed by social withdrawal, distraction and problem solving as coping strategies in study of siblings of physically ill children by McHale and Gamble (1999). However, in our study distraction was the most common coping strategy used followed by social support, praying, problem

solving and wishful thinking. Their sample consisted of children of only adolescents which might be the reason for the differences in coping style. There were no statistical differences in the coping strategies used by the siblings of disabled and non disabled children. Similarly we also found no differences between the two groups in our study.

Coping skills were not found to be related to adjustment by Ross and Cuskelly (2006) in their study on siblings of children with autism and Madan and Swain (1993) in study of siblings of children with cancer. Our study also did not show any statistically significant difference in the coping style used by the two groups. Sibling relationships were found to be a important factor affecting the adjustment of the sibling in all the studies of siblings. Non-conflictual sibling relationship was stated to be protective for siblings of children with Down syndrome but not for siblings of children with autism. (Fisman et al., 1996). However, Labay and Walco (2004) in their study of siblings of children with cancer revealed that warm and nurturing relationship with the ill sibling could affect the adjustment adversely, by amplifying the stress perceived. However our study failed to bring out any evidence regarding the influence of sibling adjustment. It might be explained by the fact that while we used a parental report of sibling relationship the other studies have mostly used self reports. Overall siblings of our study has shown good companionship with lack of rivalry and embarrassment .This is similar to study of siblings of children with anxiety disorders by Dia et al. (2006) . This might be also because of the fact that sibling relationships in non industrialsied background is said to be obligatory (Cicirelli, 1994).

Parental stress was a significant risk factor affecting the adjustment of the sibling in all the studies reviewed. Stoneman and Brody described poorer adjustment and increased behavioural problems in siblings when there was high level of parental stress. Similarly parental stress and dysfunction was identified to be a risk factor for adjustment problems in siblings of children with physical illness (Jackson et al., 2008 ; Daniels et al., 1987).

Warm and nurturing family environment is significantly important in the adjustment of sibling of children with mental illness (Fisman et al., 1996). Family functioning was also found to be significantly correlated with the adjustment as reported by Barnett and Hunter (2011) in their study of siblings of children with mental health difficulties. However our study failed to identify any problems in family functioning in families of children with mental illness in both the groups, which might be explained by the culture of greater cohesiveness of Indian families.

Consistent with findings from studies by Cohen et al. (1994), our studies also did not find any significance of life event as a risk factor for adjustment. However it is contrary to findings by Kilmer et al who reported that adverse life events approached statistical significance in predicting sibling adjustment. This might be due to the self report nature of the scale they used in the study by Kilmer et al. (2008), where respondents had a higher score of 9.6 on Life Event Check List.

VI.f. Predictive modeling for poor adjustment among siblings

The factors that came significant in the predictive model were the high socio-economic status and the use of problem solving coping. As there are no predictive models using these variable in the previous studies a direct comparison with the literature is difficult.

VI.g. Strengths of the study

The strengths of our study are that the methodology had included steps to minimize biases at different level of the study. Although the sample size we could collect was lesser than the *a priori* sample size calculation for the multiple regression for up to 15, however, the final multiple regression analysis used only those found to be statistically significant in the bivariate analysis and thus only three variables were analysed using multiple regression of model (including the constant). This model building required only a sample size of 110 and thus was adequate for giving sufficient power to the study. A homogenous sample of major and minor mental illness was recruited for the study with the appropriate sample selection criteria. Also, the dependent variable was quantified with a primary assessment and secondary assessment measures thereby improving the quality of the dependent variable. Most of the significant variables were quantified with standardized instrument improving the quality of the data on independent variables. The control arm strengthened the specificity of the risk factors to the identification of poor adjustment among siblings in irrespective of if they were from the major or minor mental illness group. The principal investigator was blinded to the diagnosis of major or minor

mental illness. Information bias was minimized using information from multiple sources. Multiple regression was used to minimize the effects of the confounders on dependent variable.

VI.h. Limitations of the study

The limitations of this study are firstly, this study was conducted on a clinical population and therefore it compromises the generalisability of the findings. Secondly, the instruments although were standard instruments, many of them were not validated for the Indian culture and context, thus bringing in a small amount of rating bias. Thirdly, the cultural risk factors were not included in the study and this could have decreased the overall variance of the risk model we had developed. Finally, those who did not participate in the study for various reasons could not be compared with the study sample to see if there are any differences in their predictive factor profile.

VI.i. Clinical implications

The clinical implications of our study from a diagnostic work-up perspective is that psychological assessments for adjustment is necessary among the siblings of children and adolescents with major and minor mental illnesses. The demographic, clinical, parental and family variables need to be assessed as possible risk factors for poor adjustment among the vulnerable population of siblings. Those siblings with the risk factors of low socio-economic status and using of problem solving coping need to be offered psychotherapeutic interventions when they have poor adjustment.

The therapeutic implications of our findings in the area of prevention could be sizable. It is interesting to note that in our study one of the risk factors, coping style, were modifiable in nature and the risk factors of socio-economic factor was not modifiable. The predictive model suggests that the combination of poor socio-economic status and using of problem solving coping result in poor sibling adjustment and thus pre-emptive positive mental health needs to be addressed in children with this combination of risk factors.

VI.j. Future directions

We suggest that further studies are required with community samples instead of clinical samples and also should include the cultural factors in the risk model. Methodologically, we suggest that the future studies can adopt longitudinal studies to the incidence associated with the relative risk of the different factors in the causation of poor adjustment in this vulnerable population. In cross sectional studies we suggest that factorial design be used to elicit the variance and risk each predictive factor brings in to manifesting poor adjustment clinically. Finally, studying the pathway to poor adjustment is recommended with a larger sample size.

CHAPTER VII: SUMMARY AND CONCLUSION

Extensive literature survey demonstrated that there is significant paucity on the literature related to the adjustment of siblings to minor and mental illness.

This prospective, cross-sectional study with adequate sample size was therefore conducted to document if there is a difference in the adjustment among siblings with major and minor mental illness as well as identifies the predictive factors associated with poor adjustment among the siblings. Also a parsimonious model was built to predict siblings with the highest risk of poor adjustment.

The diagnosis of having minor and mental illness as well as quantification of adjustment among siblings were done using standard measures and independent assessors provided quality sample for the bivariate and multivariate analyses needed to prove the two hypothesis.

The difference in adjustment with significantly poorer adjustment among siblings of children with major mental illness proved our first hypothesis. The independent factors of socio-economic status of the sibling and use of problem solving coping were found to be significantly associated with the poor adjustment among siblings proving our second hypothesis. Also, socio-economic status of the sibling and use of problem solving coping cumulatively resulted in the predictive model.

The strengths of the study are the various methodological and statistical steps used to minimize the sampling bias, rater and rating bias and controlling the confounder. The main caveats being the restricted generalisability of the findings, using western measures for some independent measures. Finally, we recommend that longitudinal, factorial models with measures validated in India are further needed in India.

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APPENDICES

APPENDIX I

PATIENT DATA SHEET

1. Name of the child/adolescent Hospital No-
2. Chronological age-
3. Gender- Male / Female
4. Diagnosis
5. Duration Of illness

6. Age of the sibling
7. Sex of the sibling
8. Birth order of sibling
9. Educational level of the sibling

10. Age of parents– Father: Mother: Primary Caregiver:
11. Status of parents: Married / Widowed / Divorced / Separated / Others
12. Type of family-Nuclear / Joint
13. Habitat-Urban / Rural

APPENDIX II

PRE ADOLESCENT ADJUSTMENT SCALE

no	item	yes	no
1	My parents get annoyed with me easily		
2	The school is a burden for me		
3	My neighbors are not good people		
4	My parents give me full freedom to play		
5	My teacher encourages me very much in my studies		
6	I do not want to make many friends		
7	My friends don't allow me to do my school work		
8	I don't get frightened in the presence of my teachers		
9	The teacher takes lot of work from us in the school		
10	I hesitate to speak before others in the class		
11	My friends in the school tease me		
12	My teacher listens to me		
13	My parents take care of my amusements		
14	I live very happily with my brothers and sisters at my home		
15	My parents interfere with me in every day affairs		
16	I feel inferior to others		
17	I am very happy in the company of my friends		
18	I am not friendly with my companions		
19	I want more holidays		
20	Very few friends help me		
21	I don't like my friends at all		
22	I go to school daily		
23	I don't feel hesitant in asking questions to the teacher		
24	We have got sufficient freedom in the class		
25	Everybody pays attention to whatever I say		
26	My teacher does not make me understand anything properly		
27	I shall be happy if my teacher is transferred		
28	The rules of the school seem to be senseless to me		
29	I do not get angry easily		
30	I like my parents very much		
31	My parents don't allow me to go out alone		
32	Nobody at home helps me in my school work		
33	I like to study very much		
34	I don't have the habit of quarreling with others		
35	I don't like frivolous jokes		
36	Some of my friends are good		
37	I can't express myself properly		
38	I trust my friends		
39	I remember everything at home, but forget in the teacher's presence		
40	My teacher is very strict		

APPENDIX III

CHILD ADJUSTMENT SCALE
Parent Report

No	Items	Hardly ever	Not usually	Inbetween	Usually	Almost allways
1	teases others					
2	is easily distracted					
3	is popular					
4	talks back to adults					
5	is happy					
6	shares with others					
7	threatens others					
8	is alert					
9	is helpful to others					
10	solves problems on his or her own					
11	listens when others are talking					
12	is afraid of new things					
13	takes part in activities					
14	hits other kids					
15	ignores other people					
16	respects other people's things					
17	is talkative around others					
18	keeps trying when playing games that are hard					
19	is unhappy					
20	takes turns					
21	fights with others					
22	is loving					
23	tattles on others					
24	is shy					
25	is slow at learning new subjects at school					
26	quits working on a job when problems come up					
27	is organized					
28	is good at sports					
29	likes doing things with friends instead of family					
30	is hard to discipline					
31	wants to do well in school					
32	disobeys adults					
33	works well without the help of adults					

APPENDIX IV

Kuppusamy's Socio - Economic Status Scale

Patient name **Hospital No**

Education of head of family	score	tick	score
Professional degree	7		
Graduate	6		
Intermediate/diploma	5		
High school	4		
Middle school	3		
Primary school	2		
illiterate	1		
Occupation			
Professional	10		
Semiprofessional	6		
Clerical/shop/farm	5		
Skilled worker	4		
semiskilled	3		
unskilled	2		
unemployed	1		
Family income per month(Rs)			
>21660	12		
10830-2165	10		
8122-10829	6		
5415-8121	4		
3249-5414	3		
1093-3248	2		
<1093	1		
Total score			

Total score	class	description
26-29	1	Upper class
16-25	II	Upper middle
11-15	III	Lower middle
5-10	IV	Upper lower
<5	V	Lower

APPENDIX V

Parental Stress Scale

no	Item	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	I am happy in my role as a parent.					
2	There is little or nothing I wouldn't do for my child(ren) if it was necessary					
3	Caring for my child (ren) sometimes takes more time and energy than I have to give.					
4	I sometimes worry whether I am doing enough for my child (ren).					
5	I feel close to my child (ren).					
6	I enjoy spending time with my child(ren).					
7	My child (ren) is an important source of affection for me.					
8	Having child(ren) gives me a more certain and optimistic view for the future					
9	The major source of stress in my life is my child (ren).					
10	Having child (ren) leaves little time and flexibility in my life.					
11	Having child (ren) has been a financial burden.					
12	It is difficult to balance different responsibilities because of my child (ren).					
13	The behavior of my child (ren) is often embarrassing or stressful to me.					
14	If I had it to do over again, I might decide not to have child(ren)					
15	I feel overwhelmed by the responsibility of being a parent.					
16	Having child (ren) has meant having too few choices and too little control over my life					
17	I am satisfied as a parent.					
18	I find my child(ren) enjoyable					

APPENDIX VI

Family APGAR

The next questions are about how satisfied you feel with your family. Family means the people with whom you usually live. If you live alone, think of your family as those family members with whom you now feel the closest. For each question, please answer: *almost always, some of the time, or hardly ever.*

No	Item	Almost always	Some of the time	Hardly ever
1	I am satisfied that I can turn to my family for help when something is troubling me			
2	I am satisfied with the way my family talks over things with me and shares problems with me			
3	I am satisfied that my family accepts and supports my wishes to take on new activities or directions			
4	I am satisfied with the way my family expresses affection, and responds to my emotions, such as anger, sorrow, or love			
5	I am satisfied with the way my family and I share time together			

APPENDIX VII

Kid cope: Child And Adolescent Form

Name

Age

Sex

Situation: The experience of living with an ill sibling

Please answer the following questions by ticking your response:

No	Item	Not at all	A little	Somewhat	Pretty much	Very much
1	Does this situation make you nervous?					
2	Does this situation make you sad?					
3	Does this situation make you angry or mad?					

	Did you do this?		How much did it help?		
1. I just tried to forget it.	yes	no	Not at all	A little	A lot
2. I did something like watch TV or played a game to forget it.	yes	no	Not at all	A little	A lot
3. I stayed by myself.	yes	no	Not at all	A little	A lot
4. I kept quiet about the problem.	yes	no	Not at all	A little	A lot
5. I tried to see the good side of things.	yes	no	Not at all	A little	A lot
6. I blamed myself for causing the problem.	yes	no	Not at all	A little	A lot
7. I blamed someone else for causing the problem.	yes	no	Not at all	A little	A lot
8. I tried to fix the problem by thinking of answers.	yes	no	Not at all	A little	A lot
9. I tried to fix the problem by doing something or talking to someone.	yes	no	Not at all	A little	A lot
10. I yelled, screamed, or got mad.	yes	no	Not at all	A little	A lot
11. I tried to calm myself down.	yes	no	Not at all	A little	A lot
12. I wished the problem had never happened.	yes	no	Not at all	A little	A lot
13. I wished I could make things different.	yes	no	Not at all	A little	A lot
14. I tried to feel better by spending time with others like family or friends.	yes	no	Not at all	A little	A lot

15. I didn't do anything because the problem couldn't be fixed.	yes	no	Not at all	A little	A lot
16. I prayed	yes	no	Not at all	A little	A lot

APPENDIX VIII

Sibling Inventory of Behavior

	Never	Rarely	sometimes	often	Always
Companionship					
Accepts (Child 1) as a playmate					
Gets ideas for things they can do together					
Has fun at home with (Child 1)					
Treats (Child 1) as a good friend					
Makes plans that include (Child 1)					
Shares secrets with (Child 1)					
Empathy					
Is pleased by progress (Child 1) makes					
Wants (Child 1) to succeed					
Shows sympathy when things are hard for (Child 1)					
Is concerned for (Child 1's) welfare and happiness					
Tries to comfort (Child 1) when (s/he) is unhappy or upset					
Teach/Manage					
Teaches (Child 1) new skills					
Helps (Child 1) adjust to a new situation					
Babysits and cares for (Child 1)					
Tries to teach (Child 1) how to behave					
Rivalry					
Tattles on (Child 1)					
Is jealous of (Child 1)					
Is nosey and has to know everything about (Child1)					
Takes advantage of (Child 1)					
Blames (Child 1) when something goes wrong					
Is very competitive against (Child 1)					
Resents (Child 1)					
Aggression					
Teases or annoys (Child 1)					
Gets angry with (Child 1)					
Fusses and argues with (Child 1)					
Hurts (Child 1's) feelings					
Has physical fights with (Child 1) (not just for fun)					
Embarrassed					
Is embarrassed to be with (Child 1) in					

public					
Stays away from (Child 1) if possible					
Acts ashamed of (Child 1)					
Frowns or pouts when (Child 1) has to be with (him/her)					
Tries to avoid being seen with (Child 1)					

APPENDIX IX

LIFE EVENTS SCALE FOR INDIAN CHILDREN
DEPARTMENT OF PSYCHIATRY
POST GRADUATE INSTITUTE OF MEDICAL EDUCATION AND RESEARCH CHANDIGARH

Name _____ Age _____ Sex _____

School _____ Class _____

Informant's Name _____ Age _____ Sex _____

Relationship _____

INSTRUCTIONS:

Can you recall any significant events in child's life which may have affected the child? Specify with year and month.

How stressful do you think these events were for your child?

0	1	2	3
not at all	to some extent	to a greater extent	to considerable extent

Given below is a set of events that take place normally during the course of life. Some of these may also apply to you. Kindly indicate by yes or no, whether the event has occurred ever or in the last year ad approximate date/month/year if it has occurred. Also indicate how stressful it was for your child.

	Stress-fulness scores	Yes/No	Date/Month/Year	0, 1, 2, 3
1. Decrease in number of arguments with brothers and sisters.	18	_____	_____	_____
2. Beginning another school year.	21	_____	_____	_____
3. Visit of relatives.	30	_____	_____	_____
4. Decrease in number of arguments between parents.	28	_____	_____	_____
5. Move to a new house.	31	_____	_____	_____
6. Change in parent's financial status.	34	_____	_____	_____
7. Outstanding achievement of brother or sister.	35	_____	_____	_____
8. Acquisition of TV by family/going for a picnic or excursion.	43	_____	_____	_____
9. Increase in number of arguments with brothers and sisters.	39	_____	_____	_____
10. Outstanding personal achievement.	40	_____	_____	_____

11. Not being sent to school (against child's wish)	42	_____	_____	_____
12. Serious illness of brother/sister requiring hospital treatment.	42	_____	_____	_____
13. Loss of job by parent.	43	_____	_____	_____
14. Mother beginning full time work.	45	_____	_____	_____
15. Witnessing a serious mishap (traffic accident, fire) or death procession.	55	_____	_____	_____
16. Examinations	45	_____	_____	_____
17. Close brother or sister leaving home.	49	_____	_____	_____
18. Change of school.	49	_____	_____	_____
19. Change in father's job requiring increased absence from home.	48	_____	_____	_____
20. Physical punishment by parents.	48	_____	_____	_____
21. Problems with teacher or school work.	49	_____	_____	_____
22. Quarrel between parents/parent and neighbour/relative.	47	_____	_____	_____
23. Prison sentence of parent.	50	_____	_____	_____
24. Death of a grand parent.	51	_____	_____	_____
25. Birth of a brother or sister.	50	_____	_____	_____
26. Increase in number of arguments with parents.	51	_____	_____	_____
27. Suspension from school.	53	_____	_____	_____
28. Increase in number of arguments between parents.	54	_____	_____	_____
29. Expulsion form school.	58	_____	_____	_____
30. Beginning school.	58	_____	_____	_____
31. Excessive use of alcohol by parent leading to undesirable behaviour.	60	_____	_____	_____
32. Death of child's close friend or relative.	60	_____	_____	_____
33. Change in child's popularity with friends.	57	_____	_____	_____
34. Being kept down a year at school.	60	_____	_____	_____
35. Attaining menarche/puberty.	63	_____	_____	_____
36. Being responsible for another child's death (accidental or homicidal).	68	_____	_____	_____

APPENDIX X

Academic Stress Scale

No	Items	Never	Little of the time	Sometime	Most of the time	All the time
1	My work built up so much that I feel like crying					
2	I feel emotional					
3	My emotions stop me from studying					
4	I yelled at family or friends					
5	I feel emotionally drained by academic institution					
6	I feel I was lazy when it came to academic work.					
7	I procrastinated on assignments					
8	I am been distracted in class					
9	I am unable to study as required					
10	I have trouble concentrating in class					
11	I try to avoid class if possible					
12	I use alcohol or drugs to enable me study well					
13	I have trouble remembering my notes					
14	I couldn't breathe					
15	I have difficulty eating					
16	My hands are sweaty					
17	I have had a lot of trouble sleeping					
18	I have headaches					
19	I feel overwhelmed by the demands of study					
20	I feel worried about coping with my studies					
21	There is so much going on that I can't think straight					
21	I miss too many of my lectures					
22	I don't enough time in studying					
23	I am not really sure am interested in reading					
24	At times am unable to express myself in words					

25	I am afraid to speak or discuss in the lecture room					
26	I feel academic programme is too cumbersome for me					
27	I can't keep my mind on my studies					
28	I have trouble studying effectively					
29	A times I don't feel like studying					
30	I feel am too slow in reading compared to others					
31	I worried too much about marks to obtain in my examination					
32	I feel i am getting low marks					
33	I would like to stop going to school					
34	I have no stable place to study					
35	I don't really like my course of study					
36	I feel some textbooks are too hard for me to understand					
37	I feel some lecturers are too hard for me to understand					
38	I feel so much restless while receiving lectures					
39	There are not enough good books in the library					
40	Too much work is required in some courses					
41	I feel am not getting along with some lecturers					
42	I feel some lecturers lack interest in their students					
43	Some courses are too dull and boring					
44	Some lecturers are not friendly to students					
45	I feel lecturers are not considerate of students' feelings					
46	Some lecturers give unfair tests to students					
47	I feel I have poor memory					
48	I have trouble making up my mind about my academic work					
49	I am too forgetful and easily discouraged about academic work					
50	Total					

APPENDIX XI

PATIENT INFORMATION SHEET

1. You and your child can participate in a study conducted at Child and Adolescent psychiatry Unit, Department of Psychiatry, Mental Health Centre, Bagayam. This study attempts to understand how the siblings of mentally ill children adjust to that situation and to identify what factors can cause poor adjustment.

2. A doctor will collect information regarding various aspects of your childs illness and also will interview your well child by administering some standard instruments. Related information will also be collected from your medical records.

3. This study may benefit your child if he or she has any problems that has not come into your attention. The information you reveal may be of valuable benefit in the understanding of adjustment of siblings of children with mental illness. The results obtained from this study may benefit many children, parents and doctors across the globe

4. The information you reveal, the records and all details obtained in this study will remain strictly confidential at all times. It will be needed to be available to the person conducting the study. Your identity will not be otherwise revealed. Your personal data will be collected and processed only for research purpose in connection with the study. You will not be referred to by name or identity in any report or publication

5. If you have any queries regarding the study, kindly contact Dr Minju or Dr Paul Russell

6. There will be no payment made to you for participating in this study. You and your child do not have to make any payment for participating in this study

7. You will be required to sign the consent form after reading this information sheet, if you and your child wish to participate in this study

8. The participation in the study is voluntary. You and your child can withdraw from the study at any time. Your decision of not to participate in the study will not involve any penalty or loss of benefits or affect your future medical or psychiatric care

APPENDIX XII

Informed Consent form to participate in a research study

Study Title: Comparison of Impact of childhood major and minor mental illness on the adjustment of siblings attending a tertiary-care hospital and factors predicting poor adjustment.

Study Number:
Subject's Initials: _____ Subject's Name: _____
Date of Birth / Age:_____
Please initial box
( )
(i) I confirm that I have read and understood the information sheet dated _____ for the above study and have had the opportunity to ask questions. [ ]
(ii) I understand that my child's participation in the study is voluntary and that I am free to withdraw him/her at any time, without giving any reason, without his/her medical care or legal rights being affected. [ ]
(iii) I understand that the Sponsor of the clinical trial, others working on the Sponsor's behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my child's health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw him/her from the trial. I agree to this access. However, I understand that his/her identity will not be revealed in any information released to third parties or published. [ ]
(iv) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s) [ ]
(v) I agree to the child or adolescent under my care to taking part in the above study. [ ]

Signature (or Thumb impression) of the Parent/Legally Acceptable Representative (Guardian):_____
Date: _____/_____/_____
Signatory's Name: _____

Signature of the Investigator: _____
Date: _____/_____/_____
Study Investigator's Name: _____

Signature of the Witness: _____
Date:_____/_____/_____
Name of the Witness: _____

APPENDIX XIII

ASSENT FORM FOR PARTICIPANT CHILDREN AND ADOLESCENTS

Study title:

Comparison of Impact of childhood major and minor mental illness on the adjustment of siblings attending a tertiary-care hospital and factors predicting poor adjustment

Primary Investigator: Dr.Minju.K.A

1 Why you are here?

We want to tell you about a study about children who has siblings who are suffering from mental illness. We want to know if you would like to be in this study. This form tells you about the study. If there is anything you do not understand, please ask your parent, your guardian or the study staff.

2 Why are we doing this study?

We know it is difficult for you in many ways when you have a mentally ill sibling. We want to see how you are doing and if needed we can help you.

3 What will happen to you?

If you want to be in the study, you will have to answer few questionnaires

4 Will the study hurt?

No, there is no painful procedures used on this study

5. Will you get better if you are in the study?

If the doctor finds out a problem, she will definitely try to help you. It will also help other kids who are not involved in the study also.

6. What if you have any questions?

You can ask questions any time, now or later. You can talk to the doctors, your family or someone else.

7. **Who will know what I did in the study?**

Any information we get from you will be kept private. Your name will not be on any study paper and no one but the study staff and your guardians will know that it was you who was in the study**.**

8. **Do you have to be in the study?**

You do not have to be in the study. No one will be angry at you if you don't want to do this.
If you don't want to be in this study, just say so. We will also ask your parents if they would like you to be in the study. Even if your parents want you to be in the study you can still say no. The doctor will still take care of you.
Even if you say yes now you can change your mind later. It's up to you**.**

Do you have any questions?

What questions do you have?

Assent

I want to take part in this study. I know I can change my mind at any time.

_____ **Verbal assent given Yes**

Name of child

_____ _____ _____

Signature of Child **Age** **Date**

I confirm that I have explained the study to the participant to the extent compatible with the participants understanding, and that the participant has agreed to be in the study.

_____ _____ _____

Printed name of Person obtaining assent **Signature of Person obtaining assent** **Date**

INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE
VELLORE 632 002, INDIA

Dr.B.J.Prashantham, M.A.,M.A.,Dr.Min(Clinical)
Director, Christian Counseling Centre
Editor, Indian Journal of Psychological Counseling
Chairperson, Ethics Committee, IRB

Dr. Alfred Job Daniel, MS Ortho
Chairperson, Research Committee &
Principal

Dr. Nihal Thomas
MD, MNAMS, DNB(Endo), FRACP(Endo), FRCI
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

March 19, 2012

Dr. Minju K.A
PG Registrar
Department of Psychiatry
Christian Medical College
Vellore 632 002

Sub: **FLUID Research grant project NEW PROPOSAL**:
Comparison of Impact of childhood major and minor mental illness on the adjustment of siblings attending a tertiary-care hospital and factors predicting poor adjustment
Dr. Minju.K.A, Post-Graduate Registrar, Psychiatry, Dr. Paul Russell, Psychiatry, Dr. SatyaRaj Shankar, Dr. Priya Mammen, Psychiatry, Dr. Sushila Russell, Clinical Psychology, Psychiatry.

Ref: IRB Min. No. 7783 dated 9.3.2012

Dear Dr. Minju,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project entitled "Comparison of Impact of childhood major and minor mental illness on the adjustment of siblings attending a tertiary-care hospital and factors predicting poor adjustment" on March 9, 2012.

The Committees reviewed the following documents:

1. Format for application to IRB submission
2. Information Sheet and Informed Consent Form (English, Hindi, Tamil and Malayalam)
3. Assent form for participant children and adolescents (English, Hindi, Tamil and Malayalam)
4. Patient Data Sheet
5. Preadolescent Adjustment Scale
6. Child Adjustment Scale
7. Academic stress scale

TEL : 0416 - 2284294, 2284202 FAX : 0416 - 2262788, 2284481 E-mail : research@cmcvellore.ac.in

INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE
VELLORE 632 002, INDIA

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Chairperson, Research Committee &
Principal

Dr. Nihal Thomas
MD, MNAMS, DNB(Endo), FRACP(Endo),
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

We approve the project to be conducted as presented.

The Institutional Ethics Committee expects to be informed about the progress of the project, any serious adverse events occurring in the course of the project, any changes in the protocol and the patient information/informed consent and requires a copy of the final report.

A sum of Rs 6, 215 /- (Rupees six thousand two hundred and fifteen only) will be sanctioned for 6 months.

Yours sincerely,

Dr. Nihal Thomas
Secretary (Ethics Committee)
Institutional Review Board

Secretary
Institutional Review Board
(Ethics Committee)
Christian College
Vellore - 632 002, Tamil Nadu, India

INSTITUTIONAL REVIEW BOARD (IRB)
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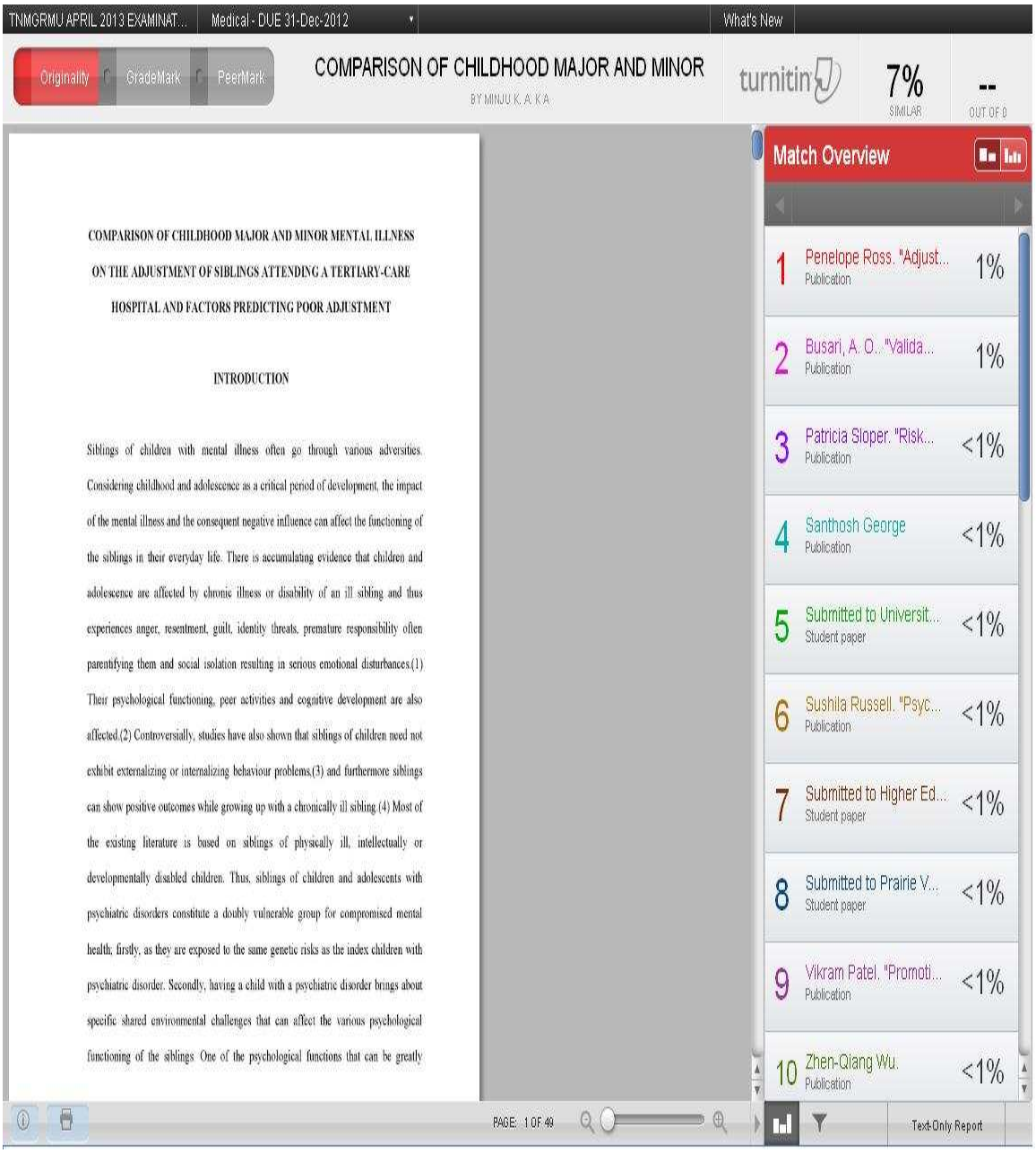
8. Life events scale for Indian children
9. Kid cope
10. Sibling relationship inventory
11. Parental stress scale
12. Family Apgar
13. Kuppusamy socioeconomic status scale
14. Cv of Drs. Minju.K.A, Paul Russell, SatyaRaj Shankar, Priya Mammen, Sushila Russell.
15. A CD containing documents 1 -14

The following Institutional Review Board (Ethics Committee) members were present at the meeting held on March 9, 2012 in the CREST/SACN Conference Room, Christian Medical College, Bagayam, Vellore- 632002.

Name	Qualification	Designation	Other Affiliations
Dr. B.J.Prashantham	MA (Counseling), MA (Theology), Dr Min(Clinical)	Chairperson(IRB)& Director, Christian Counselling Centre	Non-CMC
Mr. Harikrishnan	BL	Lawyer	Non-CMC
Mrs. S. Pattabiraman	BSc, DSSA	Social Worker, Vellore	Non-CMC
Mrs. Ellen Ebenezer Benjamin	M.Sc. (Nursing), Ph.D.	Professor, Maternity Nursing CMC.	
Dr. Vathsala Sadan	M.Sc, Ph.D	Professor, Community Health Nursing CMC.	
Dr. Jayaprakash Muliyil	BSC, MBBS, MD, MPH, DrPH(Epid), DMHC	Academic Officer, CMC	
Mr. Joseph Devaraj	BSc, BD	Chaplain, CMC	
Dr. Nihal Thomas	MD MNAMS DNB(Endo) FRACP(Endo) FRCP(Edin)	Secretary IRB (EC)& Dy. Chairperson (IRB), Professor of Endocrinology & Addl. Vice Principal (Research), CMC.	

TEL : 0416 - 2284294, 2284202 FAX : 0416 - 2262788, 2284481 E-mail : research@cmcvellore.ac.in

ORIGINALITY CERTIFIATE



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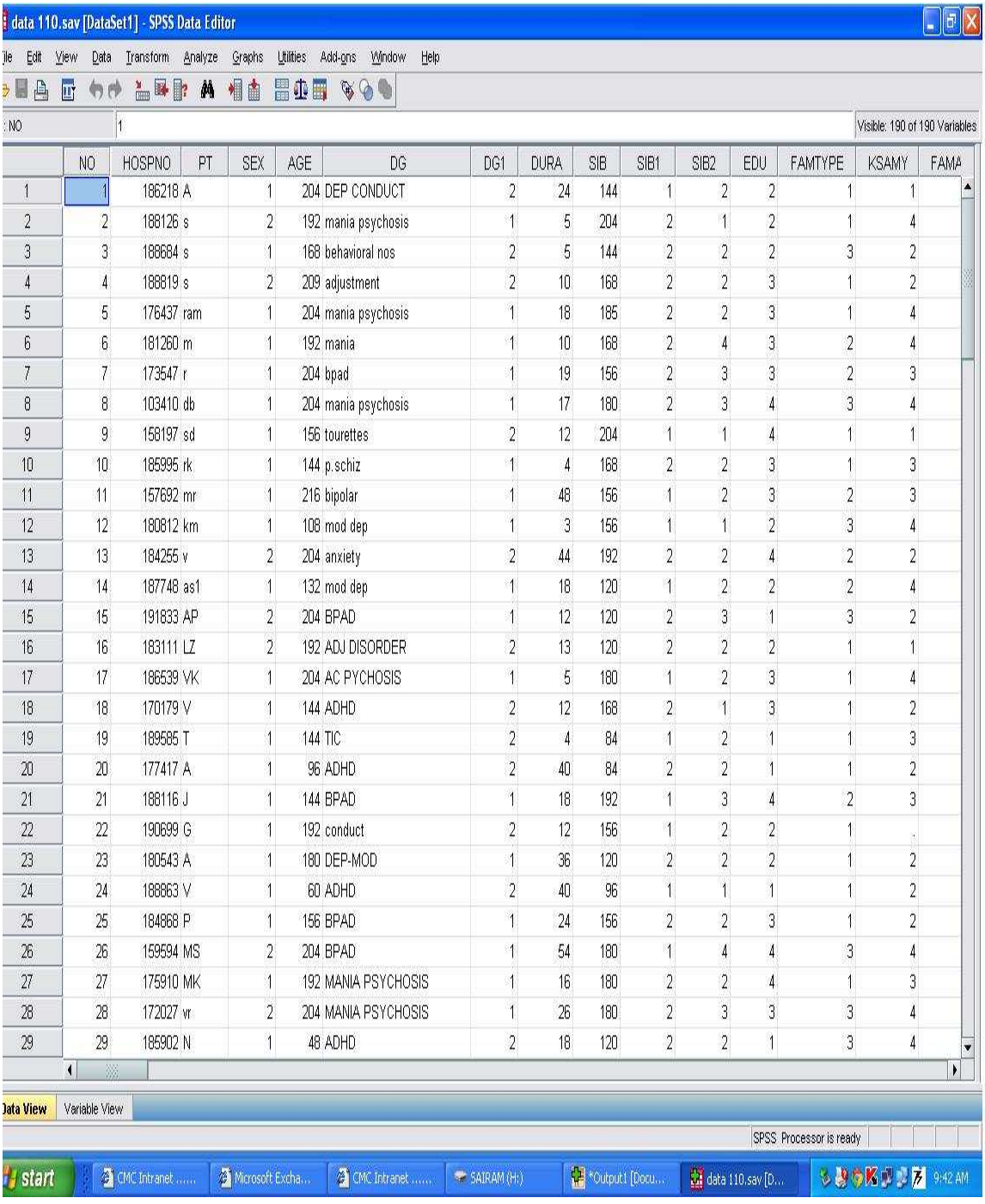

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2	2	188126	s	2	192	mania psychosis	1	5	204	2	1	2	1	4	
3	3	188684	s	1	168	behavioral nos	2	5	144	2	2	2	3	2	
4	4	188819	s	2	209	adjustment	2	10	168	2	2	3	1	2	
5	5	176437	ram	1	204	mania psychosis	1	18	185	2	2	3	1	4	
6	6	181260	m	1	192	mania	1	10	168	2	4	3	2	4	
7	7	173547	r	1	204	bpad	1	19	156	2	3	3	2	3	
8	8	103410	db	1	204	mania psychosis	1	17	180	2	3	4	3	4	
9	9	158197	sd	1	156	tourettes	2	12	204	1	1	4	1	1	
10	10	185995	rk	1	144	p.schiz	1	4	168	2	2	3	1	3	
11	11	157692	mr	1	216	bipolar	1	48	156	1	2	3	2	3	
12	12	180812	km	1	108	mod dep	1	3	156	1	1	2	3	4	
13	13	184255	v	2	204	anxiety	2	44	192	2	2	4	2	2	
14	14	187748	as1	1	132	mod dep	1	18	120	1	2	2	2	4	
15	15	191833	AP	2	204	BPAD	1	12	120	2	3	1	3	2	
16	16	183111	LZ	2	192	ADJ DISORDER	2	13	120	2	2	2	1	1	
17	17	186539	VK	1	204	AC PYCHOSIS	1	5	180	1	2	3	1	4	
18	18	170179	V	1	144	ADHD	2	12	168	2	1	3	1	2	
19	19	189585	T	1	144	TIC	2	4	84	1	2	1	1	3	
20	20	177417	A	1	96	ADHD	2	40	84	2	2	1	1	2	
21	21	188116	J	1	144	BPAD	1	18	192	1	3	4	2	3	
22	22	190699	G	1	192	conduct	2	12	156	1	2	2	1	.	
23	23	180543	A	1	180	DEP-MOD	1	36	120	2	2	2	1	2	
24	24	188863	V	1	60	ADHD	2	40	96	1	1	1	1	2	
25	25	184868	P	1	156	BPAD	1	24	156	2	2	3	1	2	
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28	28	172027	vr	2	204	MANIA PSYCHOSIS	1	26	180	2	3	3	3	4	
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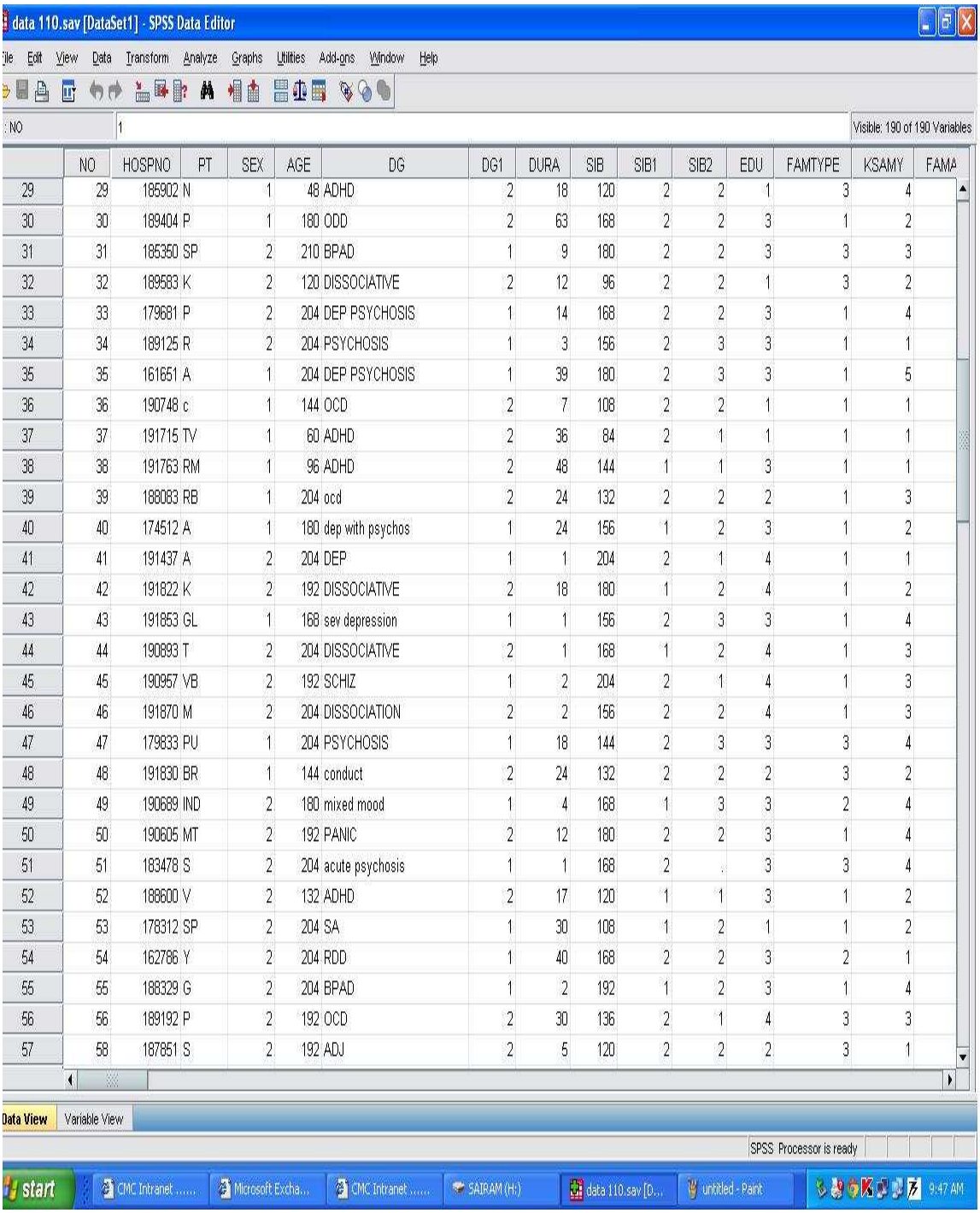

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31	31	185350	SP	2	210	BPAD	1	9	180	2	2	3	3	3	
32	32	189583	K	2	120	DISSOCIATIVE	2	12	96	2	2	1	3	2	
33	33	179681	P	2	204	DEP PSYCHOSIS	1	14	168	2	2	3	1	4	
34	34	189125	R	2	204	PSYCHOSIS	1	3	156	2	3	3	1	1	
35	35	161651	A	1	204	DEP PSYCHOSIS	1	39	180	2	3	3	1	5	
36	36	190748	c	1	144	OCD	2	7	108	2	2	1	1	1	
37	37	191715	TV	1	60	ADHD	2	36	84	2	1	1	1	1	
38	38	191763	RM	1	96	ADHD	2	48	144	1	1	3	1	1	
39	39	188083	RB	1	204	ocd	2	24	132	2	2	2	1	3	
40	40	174512	A	1	180	dep with psychos	1	24	156	1	2	3	1	2	
41	41	191437	A	2	204	DEP	1	1	204	2	1	4	1	1	
42	42	191822	K	2	192	DISSOCIATIVE	2	18	180	1	2	4	1	2	
43	43	191853	GL	1	168	sev depression	1	1	156	2	3	3	1	4	
44	44	190893	T	2	204	DISSOCIATIVE	2	1	168	1	2	4	1	3	
45	45	190957	VB	2	192	SCHIZ	1	2	204	2	1	4	1	3	
46	46	191870	M	2	204	DISSOCIATION	2	2	156	2	2	4	1	3	
47	47	179833	PU	1	204	PSYCHOSIS	1	18	144	2	3	3	3	4	
48	48	191830	BR	1	144	conduct	2	24	132	2	2	2	3	2	
49	49	190689	IND	2	180	mixed mood	1	4	168	1	3	3	2	4	
50	50	190605	MT	2	192	PANIC	2	12	180	2	2	3	1	4	
51	51	183478	S	2	204	acute psychosis	1	1	168	2	.	3	3	4	
52	52	188600	V	2	132	ADHD	2	17	120	1	1	3	1	2	
53	53	178312	SP	2	204	SA	1	30	108	1	2	1	1	2	
54	54	162786	Y	2	204	RDD	1	40	168	2	2	3	2	1	
55	55	188329	G	2	204	BPAD	1	2	192	1	2	3	1	4	
56	56	189192	P	2	192	OCD	2	30	136	2	1	4	3	3	
57	58	187851	S	2	192	ADJ	2	5	120	2	2	2	3	1	

	NO	HOSPNO	PT	SEX	AGE	DG	DG1	DURA	SIB	SIB1	SIB2	EDU	FAMTYPE	KSAMY	FAMA
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55	55	188329	G	2	204	BPAD	1	2	192	1	2	3	1	4	
56	56	189192	P	2	192	OCD	2	30	136	2	1	4	3	3	
57	58	187851	S	2	192	ADJ	2	5	120	2	2	2	3	1	
58	59	170879	V	1	204	bpad	1	24	180	2	2	3	1	4	
59	60	184922	G	1	120	HYPER CONDUCT	2	37	84	1	2	1	2	3	
60	61	189703	KRS	1	144	DISSOCIATION	2	4	138	2	1	3	1	2	
61	61	149101	A	2	204	BPAD	1	48	192	2	3	3	2	4	
62	63	188542	RG	2	192	OCD	2	8	180	1	2	3	1	4	
63	64	135281	B	1	192	BPAD	1	64	168	2	2	3	2	3	
64	65	181901	SP	2	180	ADJ	2	12	120	2	2	2	1	4	
65	66	184539	KS	1	180	BPAD	1	15	204	1	1	4	.	4	
66	67	171304	MB	2	204	MIXED ANXIETY DE	.	30	168	1	3	3	3	4	
67	68	188782	PN	2	96	SOMATOFORM	2	41	132	2	1	2	1	1	
68	69	188546	MLM	2	144	OCD	2	1	180	2	1	3	1	1	
69	70	167866	S	1	192	DEPRESSION	1	36	168	1	3	3	1	3	
70	71	175695	HK	1	204	DEP PSYCHOSIS	1	24	180	1	4	3	2	4	
71	72	183983	DR	2	204	DEPRESSION	1	6	192	2	2	3	1	3	
72	73	192304	SS	1	144	OCD	2	72	120	2	2	1	3	4	
73	74	191938	G	2	144	ptsd	2	3	156	2	1	3	3	3	
74	75	191359	p	1	168	dep	1	1	108	1	3	1	1	4	
75	76	151410	vd	2	192	bpad	1	48	204	1	1	4	1	2	
76	77	191949	1	1	185	dep	1	18	204	1	1	4	1	4	
77	78	179641	pv	2	192	rdd	1	15	180	2	3	4	1	2	
78	79	192443	st	1	120	adhd	2	13	96	1	2	1	1	2	
79	80	181902	b	1	192	mod depression	1	12	204	2	2	4	1	4	
80	81	192208	g	1	204	mania	1	1	192	1	2	3	1	1	
81	82	182091	c	2	144	depression	1	12	132	2	2	2	1	3	
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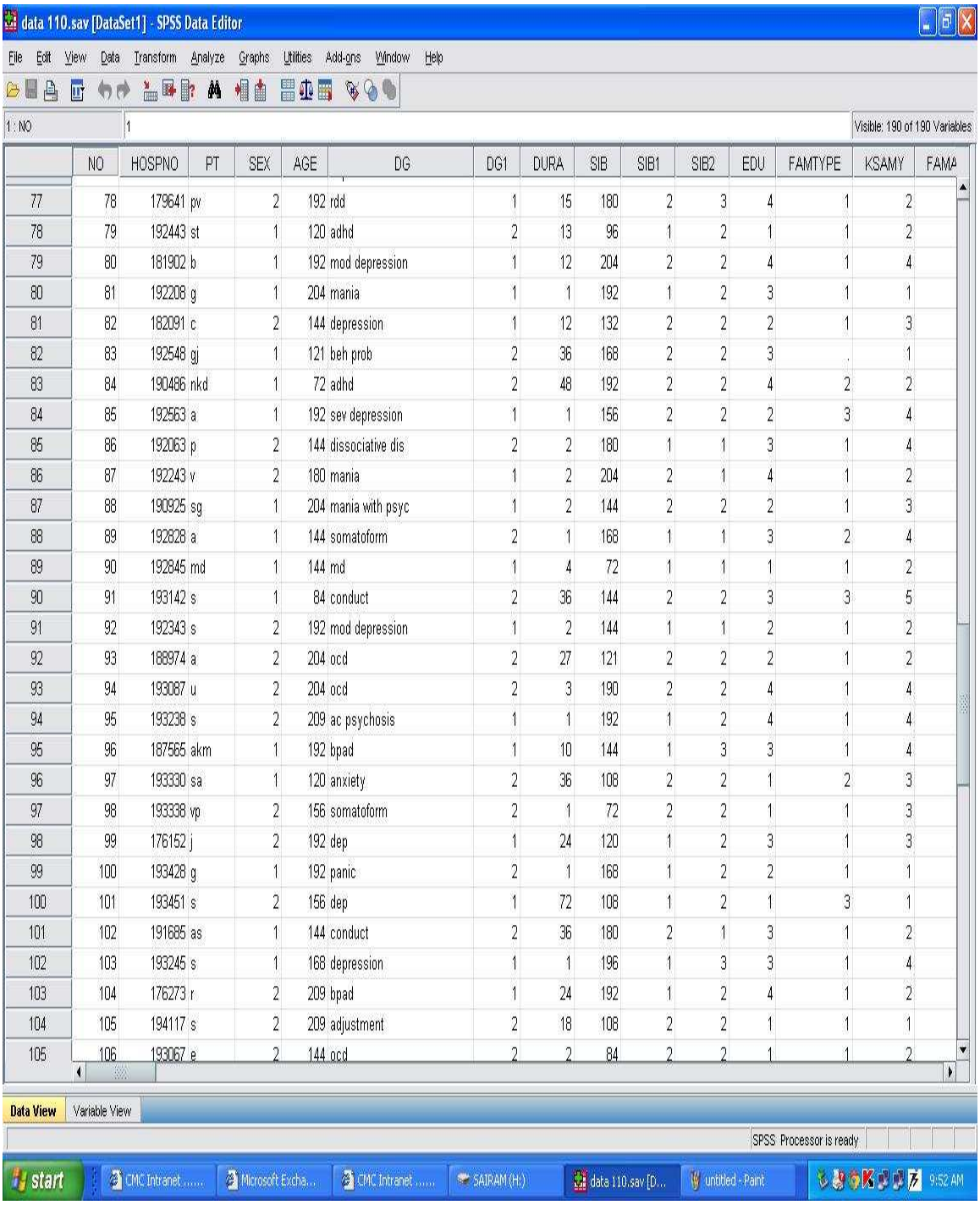

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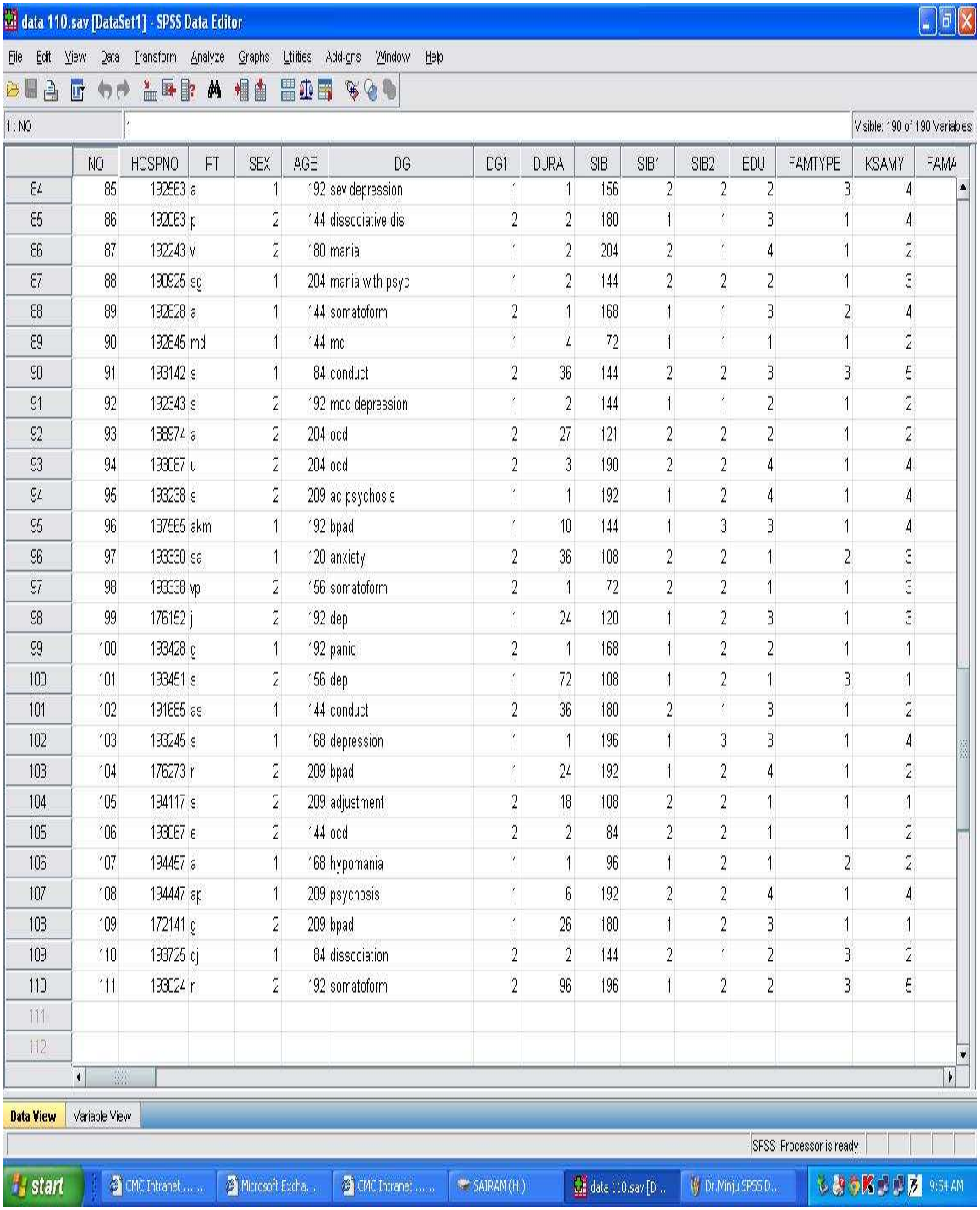
79	80	181902	b	1	192	mod depression	1	12	204	2	2	4	1	4	
80	81	192208	g	1	204	mania	1	1	192	1	2	3	1	1	
81	82	182091	c	2	144	depression	1	12	132	2	2	2	1	3	
82	83	192548	gj	1	121	beh prob	2	36	168	2	2	3	.	1	
83	84	190486	nkd	1	72	adhd	2	48	192	2	2	4	2	2	
84	85	192563	a	1	192	sev depression	1	1	156	2	2	2	3	4	
85	86	192063	p	2	144	dissociative dis	2	2	180	1	1	3	1	4	
86	87	192243	v	2	180	mania	1	2	204	2	1	4	1	2	
87	88	190925	sg	1	204	mania with psyc	1	2	144	2	2	2	1	3	
88	89	192828	a	1	144	somatoform	2	1	168	1	1	3	2	4	
89	90	192845	md	1	144	md	1	4	72	1	1	1	1	2	
90	91	193142	s	1	84	conduct	2	36	144	2	2	3	3	5	
91	92	192343	s	2	192	mod depression	1	2	144	1	1	2	1	2	
92	93	188974	a	2	204	ocd	2	27	121	2	2	2	1	2	
93	94	193087	u	2	204	ocd	2	3	190	2	2	4	1	4	
94	95	193238	s	2	209	ac psychosis	1	1	192	1	2	4	1	4	
95	96	187565	akm	1	192	bpad	1	10	144	1	3	3	1	4	
96	97	193330	sa	1	120	anxiety	2	36	108	2	2	1	2	3	
97	98	193338	vp	2	156	somatoform	2	1	72	2	2	1	1	3	
98	99	176152	j	2	192	dep	1	24	120	1	2	3	1	3	
99	100	193428	g	1	192	panic	2	1	168	1	2	2	1	1	
100	101	193451	s	2	156	dep	1	72	108	1	2	1	3	1	
101	102	191685	as	1	144	conduct	2	36	180	2	1	3	1	2	
102	103	193245	s	1	168	depression	1	1	196	1	3	3	1	4	
103	104	176273	r	2	209	bpad	1	24	192	1	2	4	1	2	
104	105	194117	s	2	209	adjustment	2	18	108	2	2	1	1	1	
105	106	193067	e	2	144	ocd	2	2	84	2	2	1	1	2	



	NO	HOSPNO	PT	SEX	AGE	DG	DG1	DURA	SIB	SIB1	SIB2	EDU	FAMTYPE	KSAMY	FAMA
84	85	192563	a	1	192	sev depression	1	1	156	2	2	2	3	4	
85	86	192063	p	2	144	dissociative dis	2	2	180	1	1	3	1	4	
86	87	192243	v	2	180	mania	1	2	204	2	1	4	1	2	
87	88	190925	sg	1	204	mania with psyc	1	2	144	2	2	2	1	3	
88	89	192828	a	1	144	somatoform	2	1	168	1	1	3	2	4	
89	90	192845	md	1	144	md	1	4	72	1	1	1	1	2	
90	91	193142	s	1	84	conduct	2	36	144	2	2	3	3	5	
91	92	192343	s	2	192	mod depression	1	2	144	1	1	2	1	2	
92	93	188974	a	2	204	ocd	2	27	121	2	2	2	1	2	
93	94	193087	u	2	204	ocd	2	3	190	2	2	4	1	4	
94	95	193238	s	2	209	ac psychosis	1	1	192	1	2	4	1	4	
95	96	187585	akm	1	192	bpad	1	10	144	1	3	3	1	4	
96	97	193330	sa	1	120	anxiety	2	36	108	2	2	1	2	3	
97	98	193338	vp	2	156	somatoform	2	1	72	2	2	1	1	3	
98	99	176152	j	2	192	dep	1	24	120	1	2	3	1	3	
99	100	193428	g	1	192	panic	2	1	168	1	2	2	1	1	
100	101	193451	s	2	156	dep	1	72	108	1	2	1	3	1	
101	102	191685	as	1	144	conduct	2	36	180	2	1	3	1	2	
102	103	193245	s	1	168	depression	1	1	196	1	3	3	1	4	
103	104	176273	r	2	209	bpad	1	24	192	1	2	4	1	2	
104	105	194117	s	2	209	adjustment	2	18	108	2	2	1	1	1	
105	106	193067	e	2	144	ocd	2	2	84	2	2	1	1	2	
106	107	194457	a	1	168	hypomania	1	1	96	1	2	1	2	2	
107	108	194447	ap	1	209	psychosis	1	6	192	2	2	4	1	4	
108	109	172141	g	2	209	bpad	1	26	180	1	2	3	1	1	
109	110	193725	dj	1	84	dissociation	2	2	144	2	1	2	3	2	
110	111	193024	n	2	192	somatoform	2	96	196	1	2	2	3	5	
111															
112															